Released Items

Student Name: _____

NC Math 2

2017–2018

NC Final Exam

Public Schools of North Carolina
State Board of Education
Department of Public Instruction
Raleigh, North Carolina 27699-6314

1 Which expression is equivalent to $\left(8w^{7}x^{-5}y^{3}z^{-9}\right)^{-\frac{2}{3}}$?

A $\dfrac{x^{\frac{10}{3}}z^{6}}{4w^{\frac{14}{3}}y^{2}}$

B $\dfrac{4w^{\frac{14}{3}}y^{2}}{x^{\frac{10}{3}}z^{6}}$

C $\dfrac{2w^{\frac{5}{3}}y^{\frac{1}{3}}}{x^{\frac{7}{3}}z^{\frac{11}{3}}}$

D $\dfrac{x^{\frac{7}{3}}z^{\frac{11}{3}}}{2w^{\frac{5}{3}}y^{\frac{1}{3}}}$

$8^{-2/3} w^{7(-2/3)} x^{-5(-2/3)} y^{3(-2/3)} z^{-9(-2/3)}$

$\frac{1}{4} w^{-14/3} x^{10/3} y^{-2} z^{6}$

$\frac{1 x^{10/3} z^{6}}{4 w^{14/3} y^{2}}$

2 A marathon is roughly 26.2 miles long. Which equation could be used to determine the time, t, it takes to run a marathon as a function of the average speed, s, of the runner where t is in hours and s is in miles per hour?

A $t = 26.2 - 26.2s$

B $t = 26.2 - \dfrac{s}{26.2}$

C $t = 26.2s$

D $t = \dfrac{26.2}{s}$

$t = \frac{\text{distance}}{\text{speed}}$ $t = \frac{26.2}{s}$

3 The force, F, acting on a charged object varies inversely to the square of its distance, r, from another charged object. When the two objects are 0.64 meter apart, the force acting on them is 8.2 Newtons. ***Approximately*** how much force would the object feel if it is at a distance of 0.77 meter from the other object?

A 1.7 Newtons

B 5.7 Newtons

C 11.9 Newtons

D 12.9 Newtons

inverse variation: $y = \frac{k}{x^2}$

$F = \frac{k}{r^2}$ $\quad 8.2 = \frac{k}{(.64)^2}$ $\quad 8.2 = \frac{k}{.4096}$ $\quad .4096(8.2) = k$

$k = 3.35872$

$F = \frac{3.35872}{(.77)^2} \approx 5.7$

4 A system of equations is shown below.

$$y = x^2 + 2x + 8$$
$$y = -4x$$

What is the smallest value of y in the solution set of the system?

A -4

B -2

C 8

D 16

the solution(s) are the intersection

type in y=, calculate intersection

intersects twice, smallest y means use (-2, 8) the one closest to the x-axis

5 The cost of a newspaper advertisement is a function of its size.

- A company wants its advertisement to have a height that is twice its width. $h = 2w$
- The newspaper charges a flat rate of \$50 plus an additional \$10 per square inch. $C = 10 \text{sq.i.} + 50$
- The company can spend no more than \$2,050 on the advertisement. $2050 = 10 \text{sq.i} + 50$

What is the maximum height of an advertisement that the company can afford?

A 5 inches

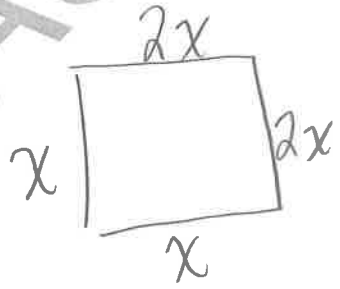
B 10 inches

C 15 inches

D 20 inches

$2050 = 10 \text{sq.i} + 50$
$-50 \quad -50$
$2000 = 10 \text{sq.in}$
$\frac{2000}{10} = \frac{10 \text{sq.in}}{10}$
$\text{Area} = 200 \text{ sq. inches}$

x = width



$2x \cdot x = 200$
$2x^2 = 200$
$\sqrt{x^2} = \sqrt{100}$
$x = \pm 10$
~~-10~~ 10 ✓
$10 = w$
$2w = h \quad 2(10) = 20 = h$

of work it backwords...
only $20 \cdot \frac{1}{2}(20) = 200$

6 Farmer Brown built a rectangular pen for his chickens using 12 meters of fence.

- He used part of one side of his barn as one length of the rectangular pen.
- He maximized the area using the 12 meters of fence.

Farmer Johnson built a rectangular pen for her chickens using 16 meters of fence.

- She used part of one side of her barn as one length of the rectangular pen.
- The length of her pen was 2 meters more than the length of Farmer Brown's pen.
- The width of her pen was 1 meter more than the width of Farmer Brown's pen.

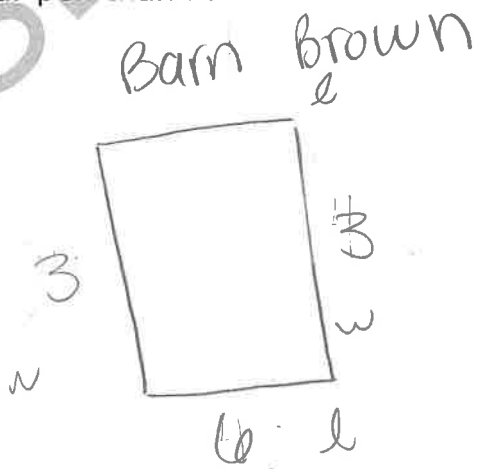
How much larger is Farmer Johnson's rectangular pen than Farmer Brown's?

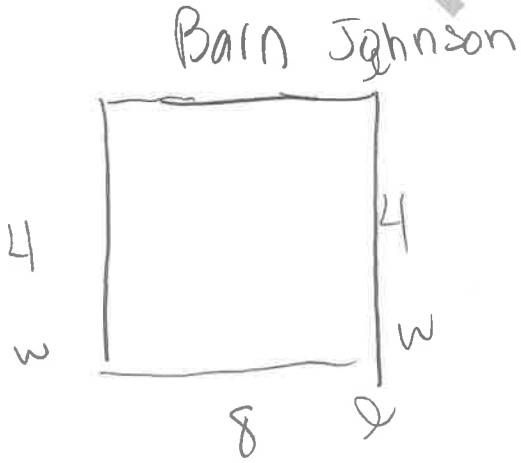
A 24 square meters

B 18 square meters

C 16 square meters

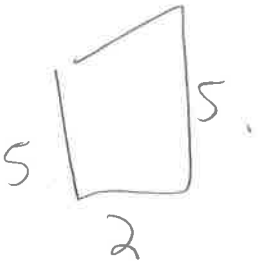
D 14 square meters





$(4 \times 8) - (3 \times 6) = 32 - 18$

14



7 Suppose that Jamal can choose to get home from work by taxi or bus.

- When he chooses to get home by taxi, he arrives home after 7 p.m. 8 percent of the time.
- When he chooses to get home by bus, he arrives home after 7 p.m. 15 percent of the time.
- Because the bus is cheaper, he uses the bus 60 percent of the time.

total after 7pm .8(.15) = .23

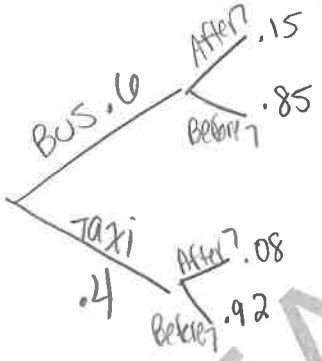
What is the ***approximate*** probability that Jamal chose to get home from work by bus, given that he arrived home after 7 p.m.?

A 0.09

B 0.14

C 0.60

D 0.74



P(Bus) + P(After 7) - P(Bus and after)
.6 + .23 - (.6 × .15)

8 The graph of $f(x) = 2x^2 - 3x + 5$ will be translated 8 units down, producing the graph of $q(x)$. Which equation represents the new function, $q(x)$?

A $q(x) = 2x^2 - 3x - 3$

B $q(x) = 2x^2 - 11x + 5$

C $q(x) = 2x^2 - 3x + 13$

D $q(x) = 2x^2 + 5x + 5$

8 units down

$2x^2 - 3x + 5 - 8$

$2x^2 - 3x - 3$

9 The equation $2x^2 - 5x = -12$ is rewritten in the form of $2(x - p)^2 + q = 0$. What is the value of q?

$2(x^2 - \frac{5}{2}x + \_\_) = -12 + \_\_$

$2(x^2 - \frac{5}{2}x + \frac{25}{16}) = -12 + 2(\frac{25}{16})$

$2(x - \frac{5}{4})^2 = -\frac{71}{8}$

$2(x - \frac{5}{4})^2 + \frac{71}{8} = 0$

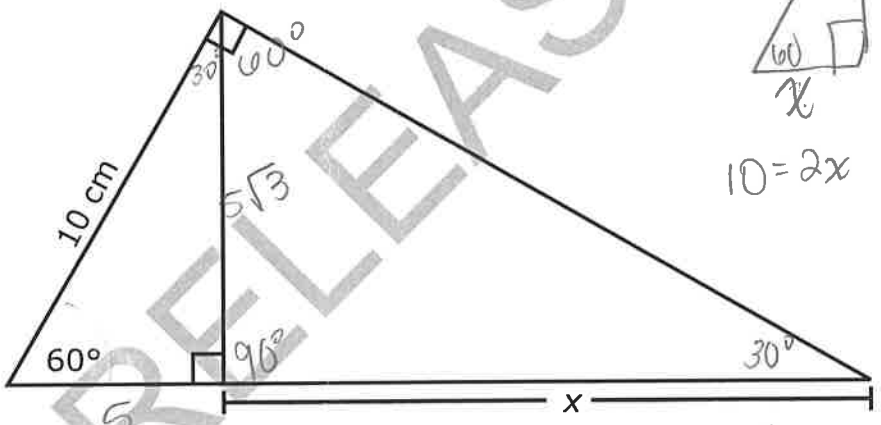
A $\frac{167}{16}$

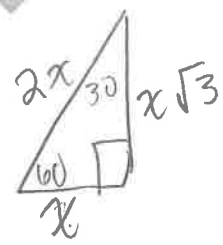
B $\frac{71}{8}$

C $\frac{25}{8}$

D $\frac{25}{16}$

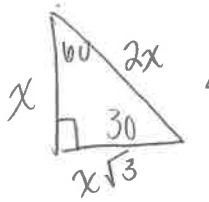
10 What is the value of x in the triangle below?

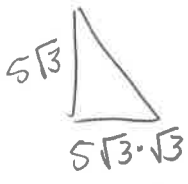




$10 = 2x \quad x = 5$

$5\sqrt{3} = x$





$= 5 \cdot 3 = 15$

A $\frac{5\sqrt{3}}{2}$ cm

B $5\sqrt{3}$ cm

C 10 cm

D 15 cm

11 The length of a rectangular prism is $4\sqrt{3}$ units. The height is $3\sqrt{6}$ units. If the volume is irrational, which could be the measure of the width of the rectangular prism?

find the one that multiplies with $\sqrt{3}$ and $\sqrt{6}$ to still be irration

$\sqrt{18} \cdot \sqrt{18} = 18$

$\sqrt{3} \cdot \sqrt{6} = \sqrt{18}$

$\sqrt{18} \cdot \sqrt{50} = \sqrt{900} \neq$ irrational

$\sqrt{18} \cdot \sqrt{12} = \sqrt{216} =$ irration

$\sqrt{18} \cdot \sqrt{8} = \sqrt{144} \neq$ irrational

A $2\sqrt{50}$

B $4\sqrt{12}$

C $5\sqrt{8}$

D $7\sqrt{18}$

12 Which function is equivalent to $y = x^2 - 6x + 10$?

to do it quick, type in y=, find vertex + use that for h & K

min (vertex) at (3, 1)

$(x-h)^2 + K$

$(x-3)^2 + 1$

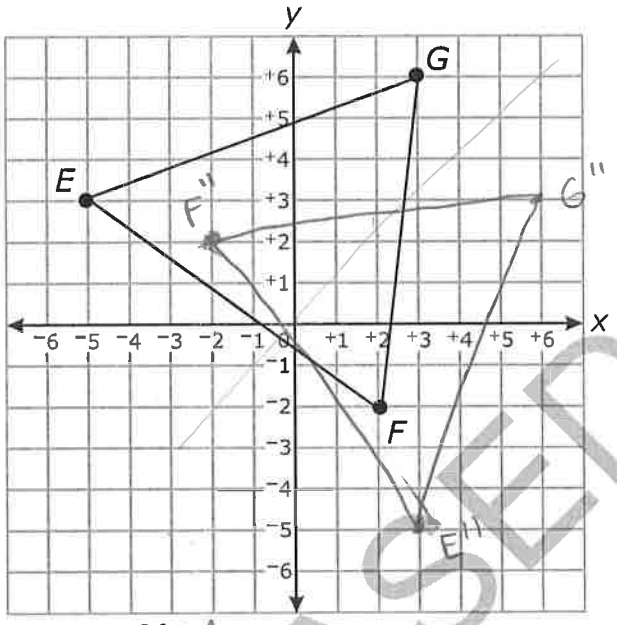
A $y = (x + 3)^2 - 1$

B $y = (x - 3)^2 + 1$

C $y = (x + 6)^2 - 10$

D $y = (x - 6)^2 + 10$

13 Triangle *EGF* is graphed below.



prime

double prime

Triangle *EGF* will be rotated 90° counterclockwise around the origin and will then be reflected across the *y*-axis, producing an image triangle. Which additional transformation will map the image triangle back onto the original triangle?

A rotation 270° counterclockwise around the origin

B rotation 180° counterclockwise around the origin

C reflection across the line $y = -x$

D reflection across the line $y = x$

90° CCW $\Rightarrow (x, y) \Rightarrow (-y, x)$

$F(2,-2)$ $F'(2,2)$ $F''(-2,2)$

$G(3,6)$ $G'(-6,3)$ $G''(6,3)$

$E(-5,3)$ $E'(-3,-5)$ $E''(3,-5)$

Reflect y-axis, flip sign of x

$(x,y) \Rightarrow (-y,x) \Rightarrow (y,x)$

$= y = x$

reflection rule

This is the end of the NC Math 2 Released Items.

Directions:

1. **Look back over your answers for the test questions.**
2. **Make sure all your answers are entered on the answer sheet. Only what is entered on your answer sheet will be scored.**
3. **Put all of your papers inside your test book and close the test book.**
4. **Place your calculator on top of the test book.**
5. **Stay quietly in your seat until your teacher tells you that testing is finished.**
6. **Remember, teachers are not allowed to discuss items from the test with you, and you are not allowed to discuss with others any of the test questions or information contained within the test.**

NC Math 2
RELEASED Items[1]
2017–2018
Answer Key

Item Number	Type[2]	Key	Percent Correct[3]	Standard
1	MC	A	37%	N-RN.2
2	MC	D	67%	A-CED.2
3	MC	B	40%	A-REI.2
4	MC	C	33%	A-REI.7
5	MC	D	47%	F-IF.8
6	MC	D	35%	F-BF.1
7	MC	D	20%	S-CP.6
8	MC	A	61%	F-BF.3
9	MC	B	30%	A-REI.4a
10	MC	D	61%	G-SRT.8
11	MC	B	46%	N-RN.3
12	MC	B	67%	A-SSE.3
13	MC	D	23%	G-CO.5

2,15

TEST NAME: **Math 2 - Fall 2017 - Geometry Standard Review**
TEST ID: **2097110**
GRADE: **09 - Ninth Grade - 12 - Twelfth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student: _____

Class: _____

Date: _____

1. **The vertices of a square are located at (0, 2), (2, 0), (0, –2), and (–2, 0).**

   Select all transformations that will carry this square onto itself.

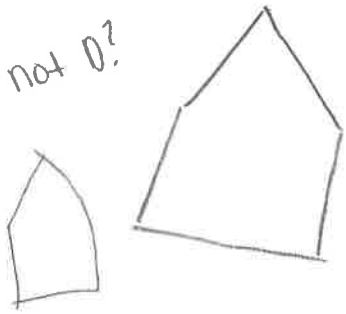
   Pick up to 4 answers.

   A. reflection across the line $y = x$
   B. reflection across the line $y = -x$
   C. reflection across the x-axis
   D. 45° rotation about the origin
   E. 90° rotation about the origin

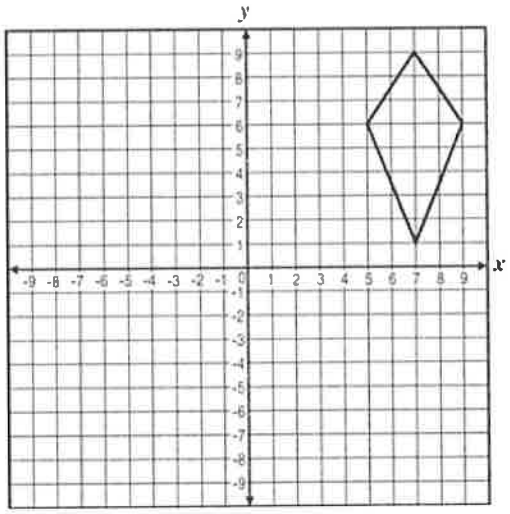
2. **Which figure can NOT be mapped onto itself by a rotation of less than 360 degrees?**

   A. square
   B. trapezoid
   C. regular hexagon
   D. regular pentagon

   How not 0?



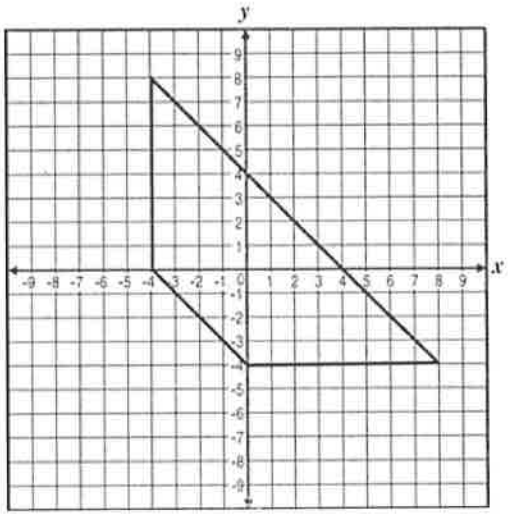
3. **The figure below is a kite with vertices at (5, 6), (7, 9), (9, 6), and (7, 1).**



   Which type of symmetry does this figure possess?

   A. reflection symmetry about the line $x = 7$
   B. reflection symmetry about the line $y = 6$
   C. 90° rotational symmetry about the point (7, 6)
   D. 180° rotational symmetry about the point (7, 6)

4. **The figure below is an isosceles trapezoid with vertices at (0, – 4), (– 4, 0), (– 4, 8), and (8, – 4).**



What is the equation for the line of symmetry of this figure?

A. $x = 0$

B. $y = 0$

C. $y = x$

D. $y = -x$

5. The opposite sides of a certain quadrilateral are congruent to each other and parallel to each other. The midpoints of two opposite sides are connected to form a midsegment. Which of these statements is **always** true?

A. Reflecting the quadrilateral across its midsegment carries the quadrilateral onto itself.

not always: trapezoid

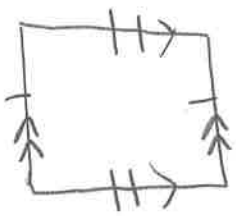
B. Rotating the quadrilateral by 90° counterclockwise about the midpoint of its midsegment will carry it onto itself.

Trapezoid

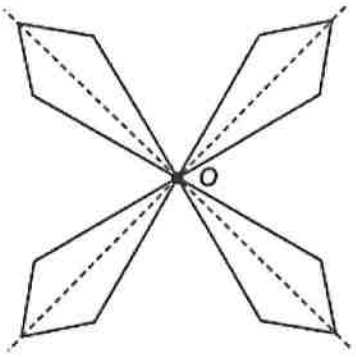
C. Reflecting the quadrilateral across its midsegment carries the quadrilateral onto itself only if the adjacent angles of the quadrilateral are congruent.

D. Rotating the quadrilateral by 90° counterclockwise about the midpoint of its midsegment will carry it onto itself only if the adjacent angles of the quadrilateral are congruent.

How to explain



6. Mr. Williams drew the image of a windmill with the perpendicular lines of symmetry shown below.



He asked two of his students what rotation about the center point, *O*, will result in an image that looks like the original. Lara said 90° clockwise and Clark said 180°. Which student(s) answered correctly?

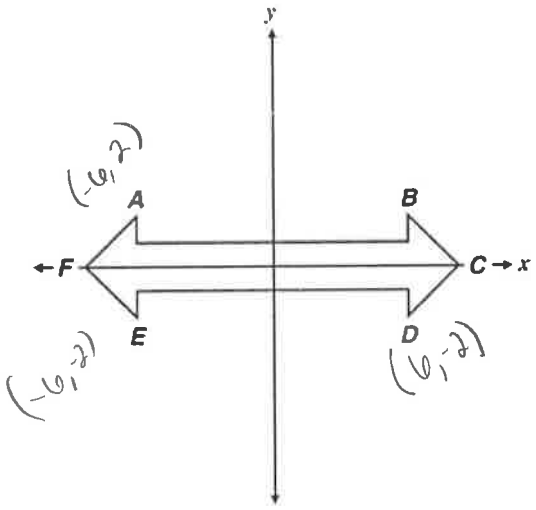
A. only Lara

B. only Clark

C. both Lara and Clark

D. neither Lara nor Clark

7. **The figure shown below is symmetric with respect to both the *x*-axis and the *y*-axis.**



If the coordinates of Point *A* are (− 6, 2), what are the coordinates of Point *D*?

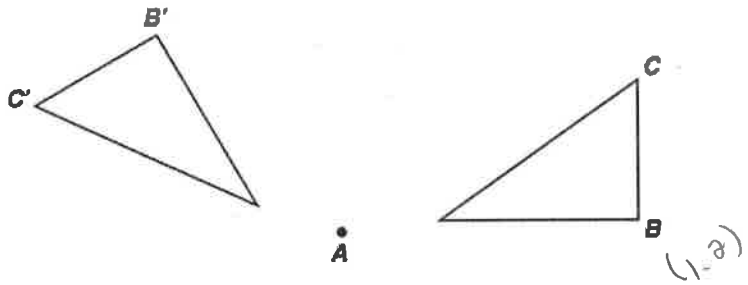
A. (6, 2)

B. (6, − 2)

C. (2, 6)

D. (− 2, 6)

8. **A rotation about Point A maps Point B to B' and Point C to C'.**



(1, 3)

Which statement must be true?

How to explain

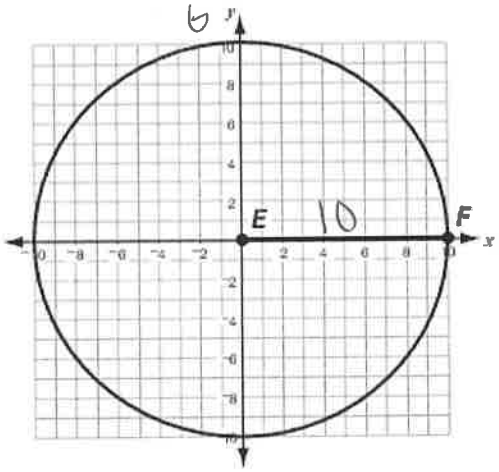
A. $m\angle C'AB' = m\angle B'AC$

B. $m\angle C'AC = m\angle B'AB$

C. If Point B is $(1, -2)$, then Point B' must be $(-1, 2)$. x y -x -y

D. If Point C is $(1, 4)$, then Point C' must be $(-4, 1)$. x y -y, x

9. William draws circle E, centered at the origin with radius $\overline{EF}$ measuring 10 units, as shown below.



William rotates $\overline{EF}$ 90° counterclockwise about the origin to form $\overline{EG}$.

Which statement is **true**?

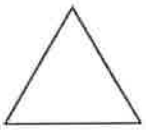
A. $\overline{EF}$ and $\overline{EG}$ are congruent and $m\angle FEG$ is 90°.

B. $\overline{EF}$ and $\overline{EG}$ are not congruent and $m\angle FEG$ is 90°.

C. $\overline{EF}$ and $\overline{EG}$ are congruent and $m\angle FEG$ is not 90°.

D. $\overline{EF}$ and $\overline{EG}$ are not congruent and $m\angle FEG$ is not 90°.

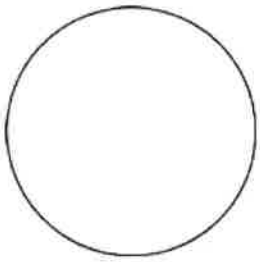
10. **Sheila created a design by translating and rotating the tile shown.**



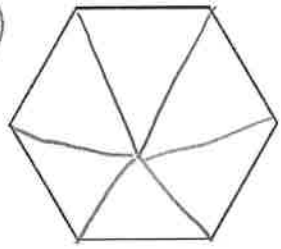
Which design did she produce?

How to explain not C?

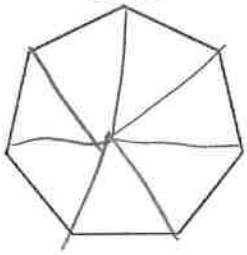
A.



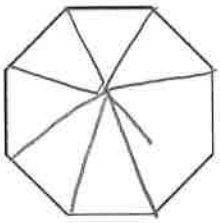
B.



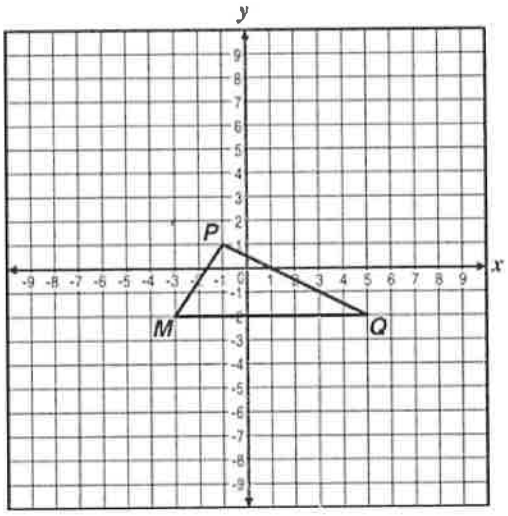
C.



D.



11. **Triangle *MPQ* is shown on the grid below.**



If $\triangle MPQ$ is reflected across the *x*-axis, what will be the coordinates of Vertex *M'*?

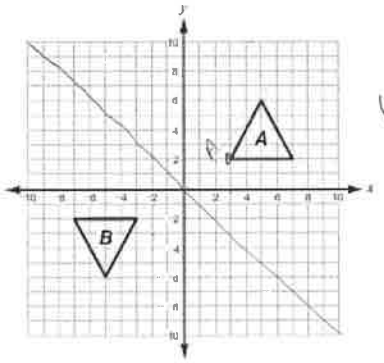
A. $(-3, 2)$

B. $(2, -3)$

C. $(3, -2)$

D. $(-2, 3)$

12. Two congruent figures, *A* and *B*, are shown on a coordinate plane below.



Which of these reflection(s) map figure *A* onto figure *B*?

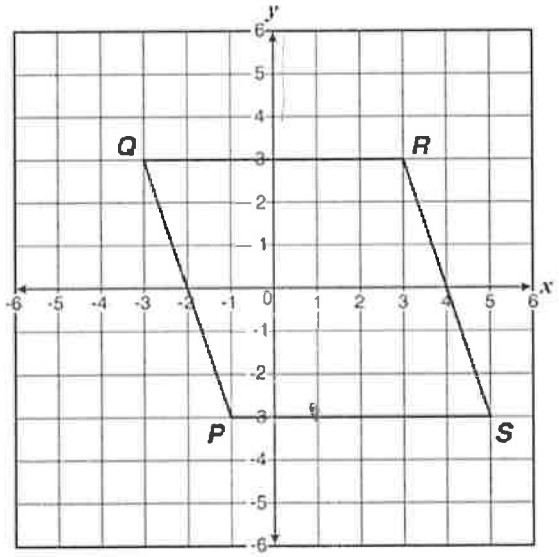
A. a reflection over the line $y = x$

B. a reflection over the line $y = -x$

C. a reflection over the line $x = 0$ followed by a reflection over the line $x = 0$

D. a reflection over the line $x = 0$ followed by a reflection over the line $y = 0$

13. **Parallelogram *PQRS* is shown on the coordinate grid.**



If *PQRS* is reflected across the *y*-axis to produce $P'Q'R'S'$, what will be the coordinates of P'?

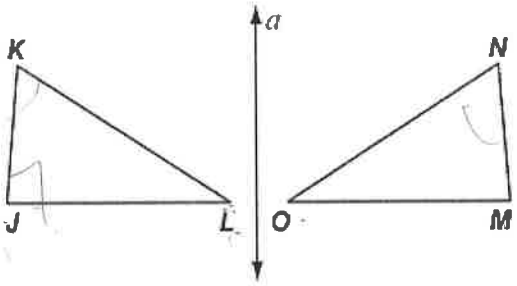
A. $(-3, -1)$

B. $(-1, 3)$

C. $(1, -3)$

D. $(1, 3)$

14. Use the given triangles to answer the question.



Triangle *JKL* is reflected across line *a* to form triangle *MNO*. Which one of these is **true**?

A. $\overline{JK} \cong \overline{MO}$, $\overline{KL} \cong \overline{NO}$, and $\angle L \cong \angle M$

B. $\overline{JK} \cong \overline{MN}$, $\overline{JL} \cong \overline{OM}$, and $\angle J \cong \angle N$

C. $\overline{JK} \cong \overline{NO}$, $\overline{KL} \cong \overline{MN}$, and $\angle L \cong \angle O$

D. $\overline{JK} \cong \overline{MN}$, $\overline{KL} \cong \overline{NO}$, and $\angle K \cong \angle N$

15. **Triangle *DEF* is mapped onto Triangle *JKL* by Transformation *T*. Which set of statements does NOT require that *T* be a rotation, a reflection, or a translation?**

A. $\overline{DE} \cong \overline{JK}$, $\overline{EF} \cong \overline{KL}$, $\overline{DF} \cong \overline{JL}$

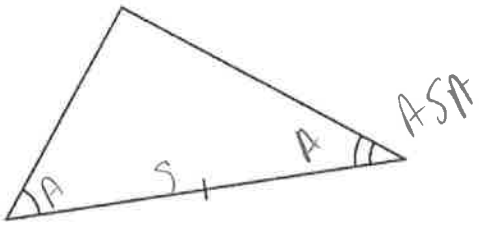
B. $\angle D \cong \angle J$, $\angle E \cong \angle K$, $\angle F \cong \angle L$ Same Δ

C. $\angle D \cong \angle J$, $\angle E \cong \angle K$, $\overline{EF} \cong \overline{KL}$

D. $\angle D \cong \angle J$, $\overline{DE} \cong \overline{JK}$, $\angle E \cong \angle K$

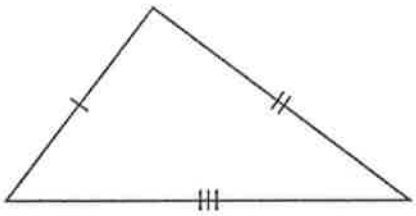
Dilation How to explain?

16. **A triangle is shown below.**

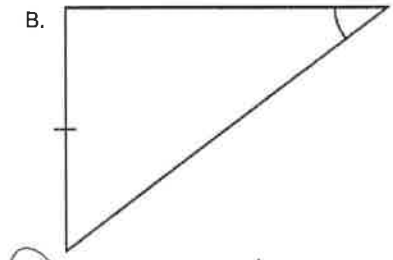


Which triangle is congruent to the triangle above?

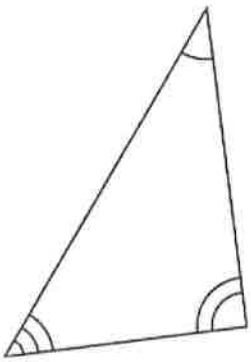
A.



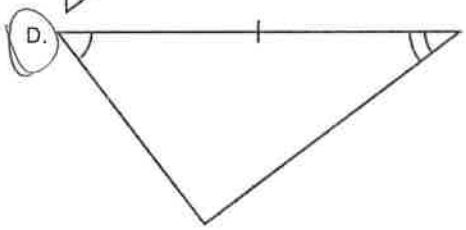
B.



C.



D.

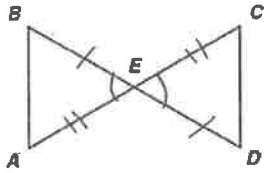


17. **Javier is writing the following proof:**

Given: E **is the midpoint of** $\overline{BD}$.
$\overline{AE} \cong \overline{EC}$

Prove: $\triangle ABE \cong \triangle DCE$

Proof:



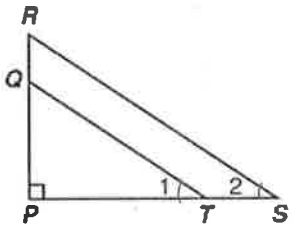
Statements	Reasons
1. E is the midpoint of $\overline{BD}$.	1. Given
2. $\overline{AE} \cong \overline{EC}$	2. Given
3. $\angle BEA \cong \angle DEC$	3. Vertical angles are congruent.
4. $\overline{BE} \cong \overline{ED}$	4. Definition of midpoint
5. $\triangle AEB \cong \triangle CED$	5.

Which of the following is the reason for Statement 5?

A. SSS
B. SAS
C. ASA
D. AAS

18. **Part of a two-column proof is shown with just the statements filled in.**

Given: $\triangle PRS$; $\triangle PQT$
$\angle 1 \cong \angle 2$;
$\angle P$ is a right angle



Prove: $\sin\angle 1 = \sin\angle 2$

Statements	
1. $\triangle PRS$; $\triangle PQT$ $\angle 1 \cong \angle 2$; $\angle P$ is a right angle	Given
2. $\angle P \cong \angle P$	Reflexive
3. $\triangle PQT \sim \triangle PRS$	AA
4. $\frac{QP}{QT} = \frac{RP}{RS}$	C
5. $\sin\angle 1 = \frac{QP}{QT}$	
6. $\sin\angle 2 = \frac{RP}{RS}$	
7. $\sin\angle 1 = \sin\angle 2$	

Which reason CANNOT be used as a justification for any of the statements?

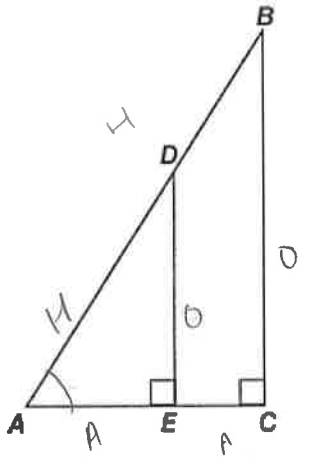
A. definition of sine

B. AA Similarity Theorem

C. Corresponding sides of similar triangles are proportional.

D. Corresponding parts of congruent triangles are congruent.

19. The right triangles shown below are similar.



Which equation involving $\cos A$ is correct?

A. $\cos A = \frac{AE}{AD} = \frac{AC}{AB}$

B. $\cos A = \frac{DE}{AD} = \frac{BC}{AB}$

C. $\cos A = \frac{DE}{AE} = \frac{BC}{AC}$

D. $\cos A = \frac{DE}{AD} = \frac{BC}{DB}$

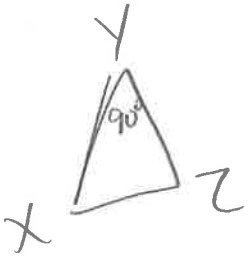
20. **In $\triangle XYZ$, $m\angle Y = 90°$. Which ratio represents the tangent of $\angle Z$?**

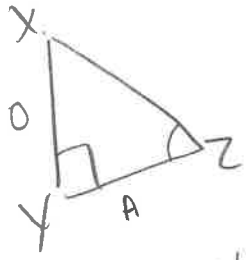
A. $\frac{ZY}{XY}$

B. $\frac{XY}{ZY}$

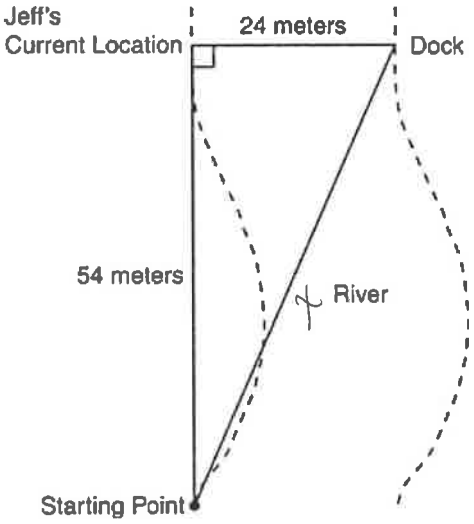
C. $\frac{ZY}{XZ}$

D. $\frac{XY}{XZ}$





21. **Jeff walked 54 meters along a river bank and saw a dock directly opposite him on the other side of the river. The river is 24 meters wide at the point where he saw the dock, as shown in the diagram below.**



$54^2 + 24^2 = c^2$

Which measurement is closest to the distance, in meters, of Jeff's starting point from the dock?

A. 30.0
B. 48.4
C. 59.1
D. 78.0

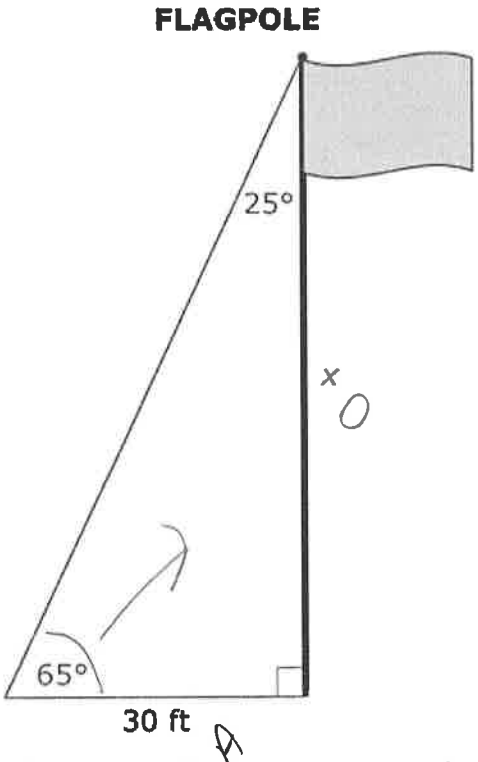
22. For which value of θ is the statement $\sin 40° = \cos \theta$ true?

A. 40°
B. 50°
C. 60°
D. 140°

how not to
trial by error

use calc

23. Two students measure the angle between the ground and the top of a flagpole at a distance of 30 feet from the base of the flagpole, as shown in the diagram.



Which equation could be used to find the height of the flagpole?

A. $\sin(65°) = \frac{x}{30}$

B. $\cos(65°) = \frac{x}{30}$

C. $\tan(65°) = \frac{x}{30}$

D. $\sin(25°) = \frac{30}{x}$

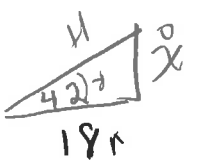
24. **When the angle of elevation of the sun is 42°, a flagpole casts an 18-meter shadow. How tall is the flagpole, to the nearest hundredth of a meter?**

A. 19.99

B. 16.21

C. 13.38

D. 12.04



$\tan(42) = \frac{x}{18}$

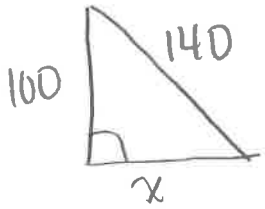
25. **A radio tower is 100 feet high. A support cable 140 feet long is fastened to the top of the tower and is anchored in the ground. How far from the base of the tower will the cable be anchored? Give your answer to the nearest foot.**

A. 40 feet

B. 98 feet

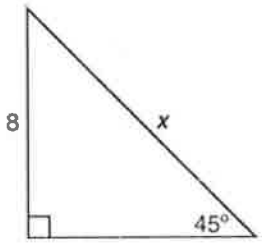
C. 120 feet

D. 172 feet



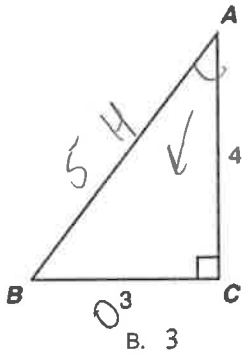
$140^2 - 100^2$

26. **What is the value of x in the triangle below?**



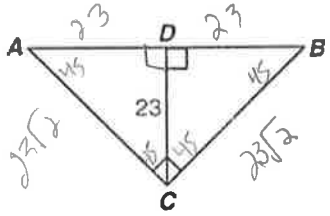
A. 4
B. 8
C. $4\sqrt{2}$
D. $8\sqrt{2}$

27. **What is the sine of $\angle A$ for the figure below?**



A. $\frac{3}{5}$
B. $\frac{3}{4}$
C. $\frac{4}{5}$
D. $\frac{5}{4}$

28. **The figure below shows $\triangle ABC$**

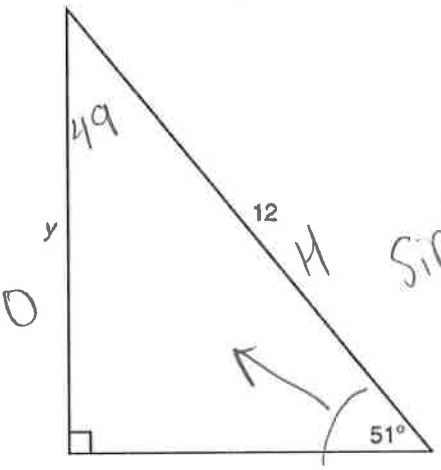


If $\triangle ABC$ is an isosceles triangle, what is the approximate length of $\overline{BC}$?

A. 23
B. 32
C. 39
D. 46

32.5 round up?

29. **A right triangle is shown below with the dimensions given in units.**

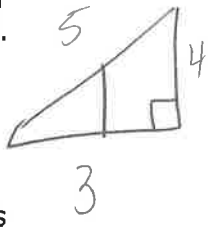


O H $\sin(51) = \frac{y}{12}$

Which measurement is closest to the value of *y* in units?

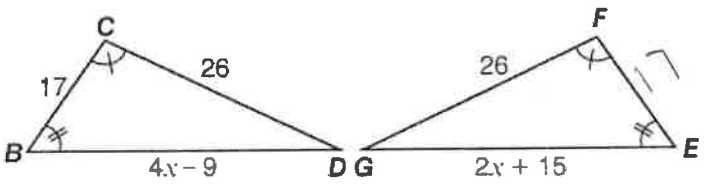
A. 7.6
B. 9.3
C. 9.7
D. 14.8

30. Omar is setting up a proof of the Pythagorean theorem. He draws a scalene right triangle and plans to use similar triangles in his proof. What else should he draw?



A. the perpendicular bisector of the triangle's hypotenuse
B. the angle bisector of the triangle's right angle
C. the median from the triangle's right angle
D. the altitude to the triangle's hypotenuse

31. In the figure below, determine the perimeter of $\triangle EFG$.



$4x - 9 = 2x + 15$

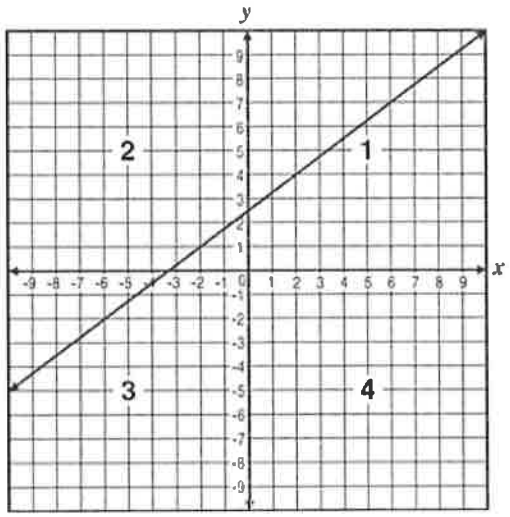
$2x = 24$

$x = 12$

$24 + 15 = 39 + 17 + 26$

A. 39 units
B. 55 units
C. 66 units
D. 82 units

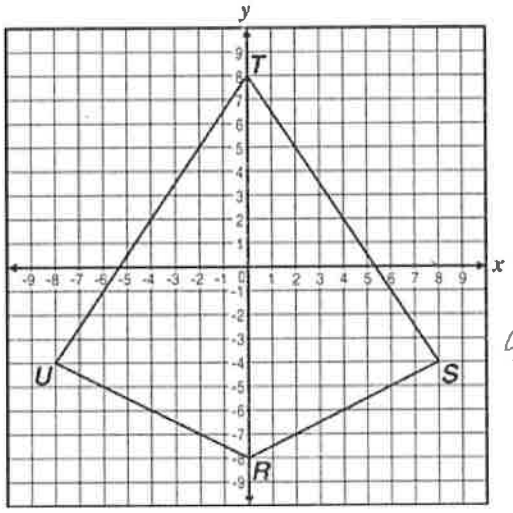
32. **The grid below includes a line that will be dilated about a point, *P*. The dilation will include the same points as the original line.**



Point *P* CANNOT be located in which numbered quadrant of the graph?

A. 1
B. 2
C. 3
D. 4

33. **Consider the figure below.**

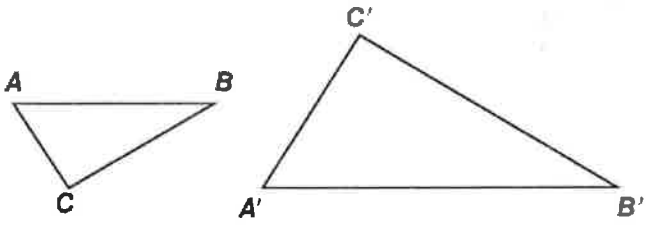


S(8, -4)
S'(4, -2)

What are the coordinates of Point *S* after a dilation with the center at the origin and a scale factor of $\frac{1}{2}$?

A. (2, – 1)
B. (4, – 2)
C. (8, – 4)
D. (16, – 8)

34. Martin dilated $\triangle ABC$ and then reflected it to produce $\triangle A'B'C'$.



Which statement must be **true**?

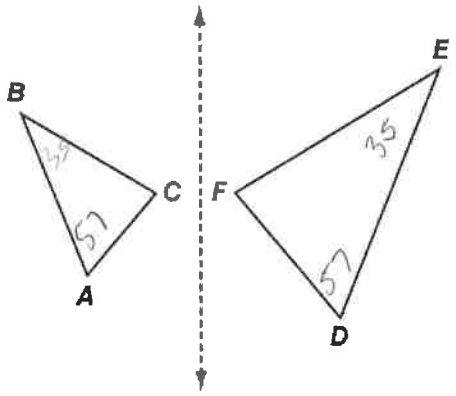
A. $\angle A \cong \angle C'$

B. $\angle C \cong \angle A'$

C. $\triangle ABC \sim \triangle A'B'C'$

D. $\triangle ABC \cong \triangle A'B'C'$

35. Examine the following figure in which $\triangle ABC$ was dilated and then reflected across the given line to create $\triangle DEF$.



If $m\angle A = 57°$ and $m\angle E = 35°$, which statement must be true?

A. $m\angle B = 57°$ and $m\angle D = 35°$

B. $m\angle B = 35°$ and $m\angle D = 57°$

C. $\overline{BC} \cong \overline{EF}$, $\overline{BA} \cong \overline{ED}$ and $m\angle B = 35°$

D. $\overline{BC} \cong \overline{EF}$, $\overline{BA} \cong \overline{ED}$ and $m\angle D = 35°$

Math 2 - Fall 2017 - Geometry Standard Review [2097110]
SUBJECT: **Mathematics**
ADMINISTRATION DATES: **Not Scheduled**
PREFERRED STANDARDS DOCUMENT: ***Mathematics**
GRADE LEVEL: **09 - Ninth Grade - 12 - Twelfth Grade**
NUMBER OF QUESTIONS: **35**

Item #	Correct Answer	Standard ID	Point Value	Type
1	A + B + C + E	MA.9-12.NC.M2.G-CO.3	1	Checklist
2	B	MA.9-12.NC.M2.G-CO.3	1	Multiple Choice
3	A	MA.9-12.NC.M2.G-CO.3	1	Multiple Choice
4	C	MA.9-12.NC.M2.G-CO.3	1	Multiple Choice
5	C	MA.K-12.CCSS.Math.Practice.MP3	1	Multiple Choice
6	C	MA.K-12.CCSS.Math.Practice.MP2	1	Multiple Choice
7	B	MA.9-12.NC.M2.G-CO.3	1	Multiple Choice
8	B	MA.9-12.NC.M2.G-CO.4	1	Multiple Choice
9	A	MA.9-12.NC.M2.G-CO.4	1	Multiple Choice
10	B	MA.9-12.NC.M2.G-CO.5	1	Multiple Choice
11	A	MA.9-12.NC.M2.G-CO.5	1	Multiple Choice
12	D	MA.9-12.NC.M2.G-CO.6	1	Multiple Choice
13	C	MA.9-12.NC.M2.G-CO.6	1	Multiple Choice
14	D	MA.9-12.NC.M2.G-CO.7	1	Multiple Choice
15	B	MA.9-12.NC.M2.G-CO.8	1	Multiple Choice
16	D	MA.9-12.NC.M2.G-CO.8	1	Multiple Choice
17	B	MA.9-12.NC.M2.G-CO.8	1	Multiple Choice
18	D	MA.9-12.NC.M2.G-SRT.6	1	Multiple Choice
19	A	MA.9-12.NC.M2.G-SRT.6	1	Multiple Choice
20	B	MA.9-12.NC.M2.G-SRT.6	1	Multiple Choice
21	C	MA.9-12.NC.M2.G-SRT.8	1	Multiple Choice
22	B	MA.9-12.NC.M2.G-SRT.8	1	Multiple Choice
23	C	MA.9-12.NC.M2.G-SRT.8	1	Multiple Choice
24	B	MA.9-12.NC.M2.G-SRT.8	1	Multiple Choice
25	B	MA.9-12.NC.M2.G-SRT.8	1	Multiple Choice
26	D	MA.9-12.NC.M2.G-SRT.12	1	Multiple Choice
27	A	MA.9-12.NC.M2.G-SRT.12	1	Multiple Choice
28	B	MA.9-12.NC.M2.G-SRT.12	1	Multiple Choice
29	B	MA.9-12.NC.M2.G-SRT.12	1	Multiple Choice
30	D	MA.9-12.NC.M2.G-SRT.4	1	Multiple Choice
31	D	MA.9-12.NC.M2.G-SRT.4	1	Multiple Choice
32	D	MA.9-12.NC.M2.G-SRT.1a	1	Multiple Choice

33	B	MA.9-12.NC.M2.G-SRT.1b	1	Multiple Choice
34	C	MA.9-12.NC.M2.G-SRT.3	1	Multiple Choice
35	B	MA.9-12.NC.M2.G-SRT.3	1	Multiple Choice

2, 8, 15

TEST NAME: **Math 2 - Fall 2017 - Stats Review**
TEST ID: **2097131**
GRADE: **09 - Ninth Grade - 12 - Twelfth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student:

Class:

Date:

1. Zenny is using a standard deck of 52 cards to determine the outcome of events involving cards. Event *A* involves selecting a black card from this deck of cards where half of the cards are black cards and the other half are red cards. Event *B* is the selection of a number card from the same deck which has a total of 36 number cards, each color having the same amount of number cards. How many cards should Zenny say are in the event $A \cup B$?

A. 18

B. 35

C. 44

D. 52

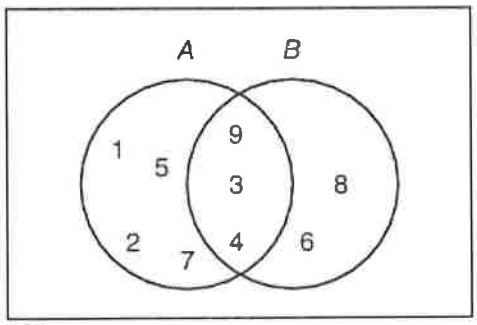
without replacement

$A = 1/2$

$B = 36/52$

26 + 18

2. Using the Venn diagram below, what is the complement of set *A*?



How ?

A. {6, 8}

B. {3, 4, 9}

C. {1, 2, 5, 7}

D. {3, 4, 6, 8, 9}

3. **The conditional probability $P(B \mid A)$ is the probability that Event *B* occurs given that Event *A* has occurred. Which formula can be used to determine this conditional probability?**

A. $P(B \mid A) = \frac{P(B)}{P(A)}$

B. $P(B \mid A) = \frac{P(A)}{P(B)}$

C. $P(B \mid A) = \frac{P(A \text{ and } B)}{P(A)}$

D. $P(B \mid A) = \frac{P(A \text{ or } B)}{P(A)}$

4. **Events *T* and *Q* are independent. Which statement about their probabilities is NOT necessarily true?**

A. $P(T \mid Q) = P(T)$

B. $P(Q \mid T) = P(Q)$

C. $P(T \mid Q) = P(Q \mid T)$

D. $P(T \text{ and } Q) = P(T) \times P(Q)$

How to explain?

5. A town conducted a survey to determine which sport lessons community members would most be interested in. Community members were only permitted to vote for one choice. The results of the survey are shown below.

	Golf	Tennis	Ice-Skating
Women	107	214	127
Men	315	72	138

Approximately what percent of the women surveyed are interested in ice-skating lessons?

A. 48%

B. 40%

C. 28%

D. 13%

6. A drug company tested the effectiveness of two flu vaccines. The tables below show the effect the two vaccines had on a sample of males and females.

Vaccine 1 Results			
	Symptoms	**No Symptoms**	
Males	27	85	112
Females	31	71	102
	58	156	214

Vaccine 2 Results			
	Symptoms	**No Symptoms**	
Males	15	52	67
Females	27	41	68
	42	93	135

Which statement is true?

A. A higher percentage of the males that received Vaccine 2 showed symptoms than the males that received Vaccine 1.

B. A higher percentage of the females that received Vaccine 2 showed symptoms than the females that received Vaccine 1. 39.7% 30

C. A higher percentage of the males that received Vaccine 1 showed no symptoms than the males that received Vaccine 2.

D. A higher percentage of the females that received Vaccine 2 showed no symptoms than the males that received Vaccine 1.

7. **Which event could BEST be represented with conditional probabilities?** How to explain

A. the probability that a science chemical is salt given that the chemical is white — Not white salt

B. the probability that a student is tardy to school on Monday given that the student was tardy to school on Friday

C. the probability that a student will take Advanced Algebra as a sophomore given that the student took Biology as a freshman

D. the probability that a pink card is drawn twice from a deck of 40 cards where 14 of the cards are pink given that the first card is replaced

8. **In Lincoln High School, 8% of the students are in the math club, 16% are in the science club, and 3% are in both clubs. What is the probability that a randomly selected student is in the math club, given that the same student is in the science club?**

A. 0.1875

B. 0.24

C. 0.375

D. 0.50

.03/.16 .1875

	SC	NO SC	
MC	3%	5%	8%
NO MC	13%	79%	92%
	16%	84%	100

9. A survey taken during class revealed 30% of the students in a class bring their lunch to school. If the probability that a randomly selected student is a boy given that the student brings their lunch is 40%, what is the probability that a randomly selected student will be a boy that brings his lunch to school?

A. 10%

B. 12%

C. 70%

D. 75%

P(Boys)+P(lunch)−P(B/lunch

.4 + .3 − .6

.10

	Bring Lunch	Not	total
B			40%
G			.60%
total	30%		100%

10. **There are 25 students in Maggie's science class. Her teacher will randomly choose 2 students to give their oral reports on Monday and 4 different students to give their reports on Tuesday. What is the probability that Maggie will be chosen to give her report on Monday or Tuesday?**

A. $\frac{2}{25}$

B. $\frac{4}{25}$

C. $\frac{146}{575}$

D. $\frac{288}{575}$

$\frac{2}{25} + \frac{4}{23}$

excl

11. **Based on past experiences, Miss Olenik knows that $\frac{1}{5}$ of the mistakes on the essays she grades are grammar mistakes, $\frac{1}{8}$ of the mistakes are spelling mistakes, and $\frac{1}{12}$ of the mistakes are both grammar and spelling mistakes. If an essay is selected at random, what is the probability that the essay contains a grammar mistake or a spelling mistake?**

inclusive

A. $\frac{19}{120}$

B. $\frac{29}{120}$

C. $\frac{39}{120}$

D. $\frac{49}{120}$

P(g) + P(s) − P(g+s)

$\frac{1}{5} + \frac{1}{8} - \frac{1}{12}$

12. **There are 8 cans of cola, 6 cans of ginger ale, 4 cans of root beer, and 2 cans of orange soda in an ice chest. If Luis reaches in and pulls out one can at random, sets it aside, then pulls out another without looking, what is the probability he will select 2 cans of ginger ale?**

A. $\frac{1}{10}$
B. $\frac{1}{30}$
C. $\frac{3}{38}$
D. $\frac{3}{40}$

$\frac{6}{20} \cdot \frac{5}{19}$

13. **Jess will flip a two-sided coin and roll a number cube with numbers 1, 2, 3, 4, 5, 6 one time. What is the probability that the coin will land on tails and the number cube will show a number greater than 4 on the top face?**

A. $\frac{1}{6}$
B. $\frac{1}{4}$
C. $\frac{2}{3}$
D. $\frac{5}{6}$

$\frac{1}{2} \cdot \frac{2}{6} = \frac{3}{6} \cdot \frac{2}{6} = \frac{6}{36} \quad \frac{1}{6}$

14. **The table shows the number of votes received by 4 candidates for mayor in a city election.**

Mayoral Election Results

Candidate	Number of Votes
Nava	88,107
Jensen	87,922
Moretti	44,050
Chang	43,967

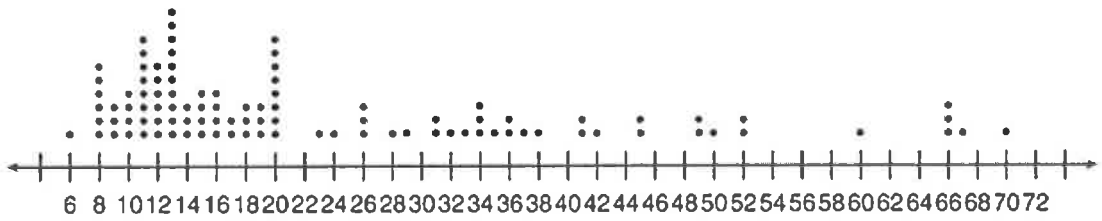
equally twice as likely

Stephen wants to simulate the random selection of a voter from this city. Which method would be the MOST accurate simulation?

A. Roll a number cube, and assign outcomes as follows: 1 or 2 = Nava; 3 or 4 = Jensen; 5 = Moretti; 6 = Chang
B. Roll a number cube, and assign outcomes as follows: 1, 2, or 3 = Nava; 4 = Jensen; 5 = Moretti; 6 = Chang
C. Flip a coin twice, and assign outcomes as follows: HH = Nava; HT = Jensen; TH = Moretti; TT = Chang
D. Flip a coin three times, and assign outcomes as follows: HHH, HHT, or HTH = Nava; HTT, THH, or THT = Jensen; TTH = Moretti; TTT = Chang

15. **A label on a cereal box states that there is 1 of 6 different prizes inside each box. A student is interested in collecting all 6 prizes and assumes that the prizes are equally distributed among the boxes. On the 48th box of cereal selected, the student finally had at least 1 of each prize. In order to test his assumption that the prizes were equally distributed, he simulated the situation 100 times.**

Cereal Box Prize Simulation



Number of Cereal Boxes Needed

Key: • = outcome of 1 simulation

Based on the outcome of this simulation, should he conclude that the prizes were equally or not equally distributed and why?

A. He should conclude that the prizes were not equally distributed because 48 boxes did not happen in any of the simulations.

B. He should conclude that the prizes were equally distributed because 48 boxes might have been the result of the next simulation.

C. He should conclude that the prizes were equally distributed because needing 48 or more boxes to collect all six prizes is common.

D. He should conclude that the prizes were not equally distributed because most of the outcomes from the simulations were under 20 boxes to collect all six prizes.

100

Simulated 100

6-70

48 in Sample Space

Math 2 - Fall 2017 - Stats Review [2097131]
SUBJECT: **Mathematics**
ADMINISTRATION DATES: **Not Scheduled**
PREFERRED STANDARDS DOCUMENT: ***Mathematics**
GRADE LEVEL: **09 - Ninth Grade - 12 - Twelfth Grade**
NUMBER OF QUESTIONS: **15**

Item #	Correct Answer	Standard ID	Point Value	Type
1	C	MA.9-12.NC.M2.S-CP.1	1	Multiple Choice
2	A	MA.9-12.NC.M2.S-CP.1	1	Multiple Choice
3	C	MA.9-12.NC.M2.S-CP.3a	1	Multiple Choice
4	C	MA.9-12.NC.M2.S-CP.3b	1	Multiple Choice
5	C	MA.9-12.NC.M2.S-CP.4	1	Multiple Choice
6	B	MA.9-12.NC.M2.S-CP.4	1	Multiple Choice
7	A	MA.9-12.NC.M2.S-CP.5	1	Multiple Choice
8	A	MA.9-12.NC.M2.S-CP.6	1	Multiple Choice
9	A	MA.9-12.NC.M2.S-CP.6	1	Multiple Choice
10	C	MA.9-12.NC.M2.S-CP.7	1	Multiple Choice
11	B	MA.9-12.NC.M2.S-CP.7	1	Multiple Choice
12	C	MA.9-12.NC.M2.S-CP.8	1	Multiple Choice
13	A	MA.9-12.NC.M2.S-CP.8	1	Multiple Choice
14	A	MA.9-12.NC.M2.S-IC.2	1	Multiple Choice
15	C	MA.9-12.NC.M2.S-IC.2	1	Multiple Choice

#6

TEST NAME: **Math 2 - Fall2017 - N/O & ARI Standards**
TEST ID: **2097086**
GRADE: **09 - Ninth Grade - 12 - Twelfth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student: _____

Class: _____

Date: _____

1. **The length of a rectangle can be represented by the expression $2x - 1$. The width of the same rectangle can be represented by the expression $x^2 - x + 3$. Which of the following expressions can represent the area of the rectangle?**

   A. $x^2 + x + 2$
   B. $2x^3 - 2x^2 - 3$
   C. $2x^3 + x^2 + 5x + 3$
   (D.) $2x^3 - 3x^2 + 7x - 3$

   $(2x-1)(x^2-x+3)$

   $2x^3 - 2x^2 + 6x - x^2 + x - 3$

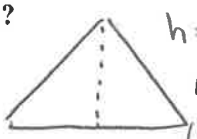
   $2x^3 - 3x^2 + 7x - 3$

2. **What is the difference of $(4m^2 - 5) - (5m - 20)$?**

   A. $-m - 25$
   B. $-m + 15$
   C. $4m^2 - 5m - 25$
   (D.) $4m^2 - 5m + 15$

   $4m^2 - 5m + 15$

3. **The height of a triangular road sign is 1 inch shorter than twice its base. If the area of the sign is 60 in.^{2}, which equation could be used to find the base (b) of the sign?**

   $h = 2b - 1$

   $A = \frac{1}{2} b(2b-1)$

   $60 = b^2 - \frac{1}{2}b$

   (A) $60 = b^2 - 0.5b$
   B. $60 = b^2 - b$
   C. $60 = 2b^2 - b$
   D. $60 = b^2 + 0.5b$

4. **Which expression is a simplified form of $2a[3b - (4ab - b^2)] - 2ab^2$?**

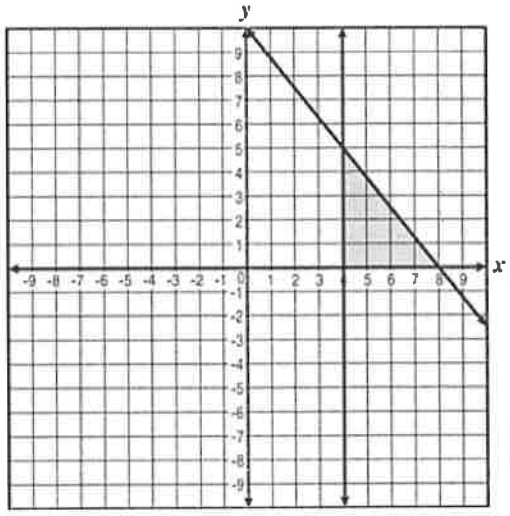
   (A) $6ab - 8a^2b$
   B. $2ab - 8a^2b$
   C. $6ab - 6a^2b - 4ab^2$
   D. $6ab - 8a^2b - 4ab^2$

   $2a[3b - 4ab + b^2] - 2ab^2$

   $6ab - 8a^2b + 2ab^2 - 2ab^2$

   $6ab - 8a^2b$

5. **The graph of a system of inequalities is shown.**



$y \le -\frac{5}{4}x + 10$

$y = 4$ 4. $\frac{5}{4}x + y \le 10$ 4 4 21

$x \ge 4$ $5x + 4y \le 40$

$y \ge 0$

What are the constraints to the system?

A. $\begin{cases} x \ge 4 \\ y \ge 0 \\ 5x - 4y \le 40 \end{cases}$

B. $\begin{cases} x \ge 0 \\ y \ge 4 \\ 5x + 4y \le 40 \end{cases}$

C. $\begin{cases} x \ge 4 \\ y \ge 0 \\ 5x + 4y \le 40 \end{cases}$

D. $\begin{cases} x \ge 0 \\ y \ge 4 \\ 5x - 4y \le 40 \end{cases}$

Half middle & square it

6. The equation $2x^2 - 5x = -12$ is rewritten in the form of $2(x - p)^2 + q = 0$. What is the value of q?

A. $\frac{167}{16}$

B. $\frac{71}{8}$

C. $\frac{25}{8}$

D. $\frac{25}{16}$

$2(x^2 - 2.5x + \_\_) = -12 + \_\_$

$2(x^2 - 5/2x + \frac{25}{16}) = -12 + 2(\frac{5}{4})^2$

$2(x - 5/4)^2 = -\frac{71}{8}$

$2(x - 5/4)^2 + \frac{71}{8} = 0$

7. What are the solutions to the equation below?

$3x^2 - 2x - 8 = 0$

$x^2 - 2x - 24 = 0$

$(x - \frac{6}{3})(x + \frac{4}{3}) = 0$

A. $x = -\frac{4}{3}, x = 2$

B. $x = \frac{4}{3}, x = -2$

C. $x = -\frac{2}{3}, x = 4$

$(x - 2)(3x + 4) = 0$

D. $x = \frac{2}{3}, x = -4$

$x = 2$ $3x = -4$

$x = -\frac{4}{3}$

8. **Charles solved the following system of equations and found the values of x to be 5 and $\frac{26}{5}$.**

$$\begin{cases} y = x^2 - 10x + 23 \\ y = \frac{1}{5}x - 3 \end{cases}$$

have to zoom in a lot

Which statement BEST describes the reasonableness of these solutions?

A. The solutions are unreasonable because the solutions cannot be fractions.

B. The solutions are reasonable because both values make the linear equation true.

C. The solutions are unreasonable because the graph of the linear equation can only intersect the graph of the quadratic equation in 1 point.

(D.) The solution is reasonable because the graph of the linear equation will intersect the graph of the quadratic equation at $(5, -2)$ and $(\frac{26}{5}, -1\frac{24}{25})$.

9. **What is the solution set for the equation $x + 2 = \sqrt{4x + 13}$?**

A. $\{-3, 3\}$

(B.) $\{3\}$

C. $\{-2, 3\}$

D. $\{2\}$

$x^2+4x+4 = 4x+13$

$x^2+4 = 13$ $(x-3)(x+3) = 0$

$x^2 = 9$ -3 is extraneous

10. **Consider the expression $(3j - 5)[3(2j + 7) - 4k(6j - 8)]$**

Which expression represents a factor of the given expression?

A. $(2j + 7)$

B. $(6j - 8)$

C. $(3 - 4k)$

(D) $(3j - 5)$

11. **Given the expression $(x - y - z)^2 - (x + y + z)^2$, which statement BEST describes the base of each term?**

A. The base of each term is a binomial with two variables.

B. The base of each term is a trinomial with two variables.

C. The base of each term is a binomial with three variables.

(D.) The base of each term is a trinomial with three variables.

12. **The quadratic functions $f(x) = 3x^2 - 12x + 7$ and $f(x) = 3(x - 2)^2 - 5$ are equivalent. What is the vertex of this function?**

(A.) $(0, 7)$

B. $(7, 0)$

(C.) $(2, -5)$

D. $(-2, -5)$

13. **Which of the following is equivalent to $(-125)^{\frac{2}{3}}$?**

DINE

$\sqrt[3]{(-125)^2}$

$\sqrt[3]{15625}$

A. $25i$

B. $5i$

C. 5

(D.) 25

14. Which expression is equivalent to $x^{\frac{2}{5}}$?

DNE

$\sqrt[5]{x^2}$

A. $-x^{\frac{5}{2}}$

B. $5x^2$

C. $\frac{2x}{5}$

D. $\sqrt[5]{x^2}$

15. **What is the exponential form of $(\sqrt{m})^{12}$?**

$(m^{1/2})^{12}$

m^6

A. m^{10}

B. m^6

C. $m^{\frac{1}{6}}$

D. $m^{\frac{1}{12}}$

Math 2 - Fall2017 - N/O & ARI Standards [2097086]
SUBJECT: **Mathematics**
ADMINISTRATION DATES: **Not Scheduled**
PREFERRED STANDARDS DOCUMENT: ***Mathematics**
GRADE LEVEL: **09 - Ninth Grade - 12 - Twelfth Grade**
NUMBER OF QUESTIONS: **15**

Item #	Correct Answer	Standard ID	Point Value	Type
1	D	MA.9-12.NC.M2.A-APR.1	1	Multiple Choice
2	D	MA.9-12.NC.M2.A-APR.1	1	Multiple Choice
3	A	MA.9-12.NC.M2.A-CED.1	1	Multiple Choice
4	A	MA.9-12.NC.M2.A-CED.2	1	Multiple Choice
5	C	MA.9-12.NC.M2.A-CED.3	1	Multiple Choice
6	B	MA.9-12.NC.M2.A-REI.4a	1	Multiple Choice
7	A	MA.9-12.NC.M2.A-REI.4b	1	Multiple Choice
8	D	MA.9-12.NC.M2.A-REI.7	1	Multiple Choice
9	B	MA.9-12.NC.M2.A-REI.2	1	Multiple Choice
10	D	MA.9-12.NC.M2.A-SSE.1a	1	Multiple Choice
11	D	MA.9-12.NC.M2.A-SSE.1b	1	Multiple Choice
12	C	MA.9-12.NC.M2.A-SSE.3	1	Multiple Choice
13	D	MA.9-12.NC.M2.N-CN.1	1	Multiple Choice
14	D	MA.K-12.CCSS.Math.Practice.MP2	1	Multiple Choice
15	B	MA.9-12.NC.M2.N-RN.2	1	Multiple Choice

12.22

TEST NAME: **Math 2 - Fall 2017 - Function Standards Review**
TEST ID: **2097094**
GRADE: **09 - Ninth Grade - 12 - Twelfth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student:

Class:

Date:

1. **In order to keep a seesaw balanced the heavier person must sit closer to the fulcrum. The distance from the fulcrum varies inversely with the weight of the person. Which table represents possible weights and distances that would balance the seesaw?**

A.

Weight of Person (pounds)	Distance from Fulcrum (feet)
72	5
90	4
120	2
180	1

B.

Weight of Person (pounds)	Distance from Fulcrum (feet)
100	4
90	3.6
75	3
70	2.8

C.

Weight of Person (pounds)	Distance from Fulcrum (feet)
90	8
120	6
160	4.5
200	3.6

D.

Weight of Person (pounds)	Distance from Fulcrum (feet)
100	2
120	3
150	5
160	8

2. **Walter budgeted \$24 to buy bags of dog food. He could buy 2 bags for \$12 each, 3 bags for \$8 each, or 4 bags for \$6 each. Which statement is true about the relationship between the number of bags (x) and the price of each bag (y) in this situation?**

A. It is an inverse variation because the ratio $\frac{x}{y}$ is always 24

B. It is an inverse variation because the product of x and y is always 24.

C. It is a direct variation because as x increases, the total price increases.

D. It is a direct variation because as y increases, the total price increases.

3. **Which table represents a situation in which y varies inversely as x?**

A.

x	y
2	10
4	20
6	30
8	40

B.

x	y	
2	20	40
4	10	40
5	8	40
40	1	40

C.

x	y
2	–2
6	–6
–4	4
0	0

D.

x	y
4	2
3	3
2	4
1	5

4. **Which function, $g(x)$, possesses function values that are 2 less than those of $f(x) = x^2$?**

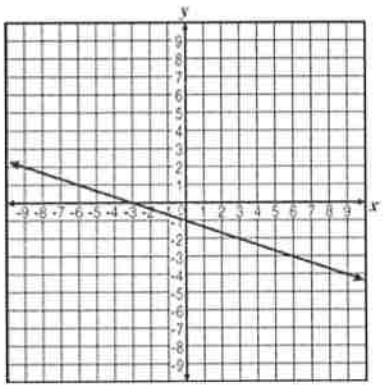
A. $g(x) = 2x^2$

B. $g(x) = 2x^2 - 2$

C. $g(x) = x^2 + 2$

D. $g(x) = x^2 - 2$

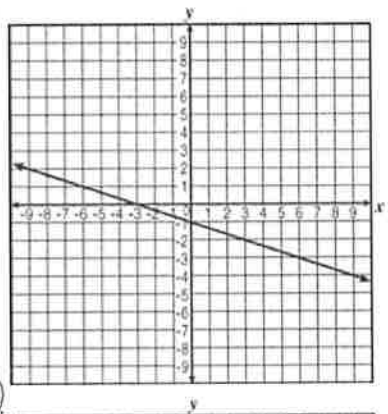
5. **The graph below represents the equation** $y = -\frac{1}{3}x - 1$



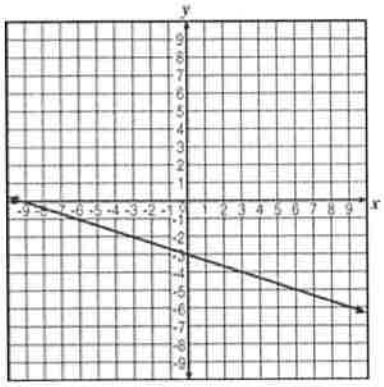
$y = -3x - 1$

Which graph BEST represents the equation of the line if the slope is changed to -3?

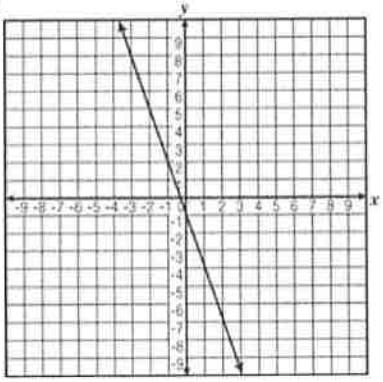
A.



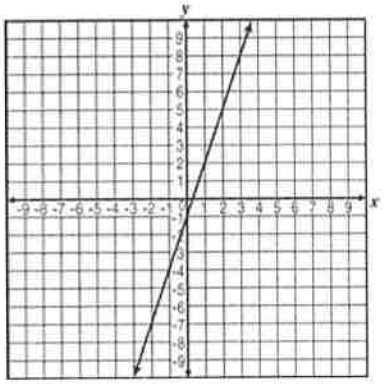
B.



C.



D.



6. **Which function,** $g(x)$, **possesses function values that are 1 more than those of** $f(x) = -3x^2$?

$-3x^2 + 1$

A. $g(x) = -4x^2$

B. $g(x) = -2x^2$

C. $g(x) = -3x^2 - 1$

D. $g(x) = -3x^2 + 1$

7. **Which function, *g(x)*, represents the graph of $f(x) = -2x^2 + \frac{1}{2}$ shifted down $\frac{3}{2}$ units?**

A. $g(x) = -\frac{7}{2}x^2 + \frac{1}{2}$

B. $g(x) = -2x^2 - \frac{3}{2}$

C. $g(x) = -2x^2 - 1$

D. $g(x) = -\frac{7}{2}x^2 - 1$

$-2x^2 + 1/2 - 3/2$

$-2x^2 - 2/2 \quad 2x^2 - 1$

8. Which translation would move the vertex of $f(x)$ up 7 units?

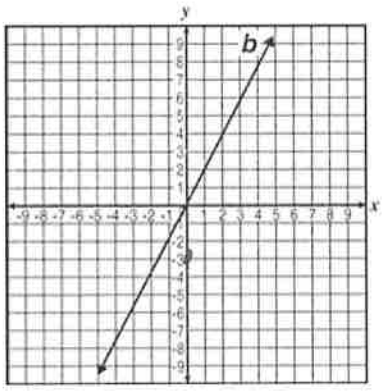
A. $f(x) - 7$

B. $f(x) + 7$ outside

C. $f(x - 7)$

D. $f(x + 7)$ OVHIO

9. **Line *b* is the image of a line after a translation of 3 units up from the original line.**



$m = 2$

$y\text{ int} = -3$

$y = 2x - 3$

Which BEST represents the equation of the original line?

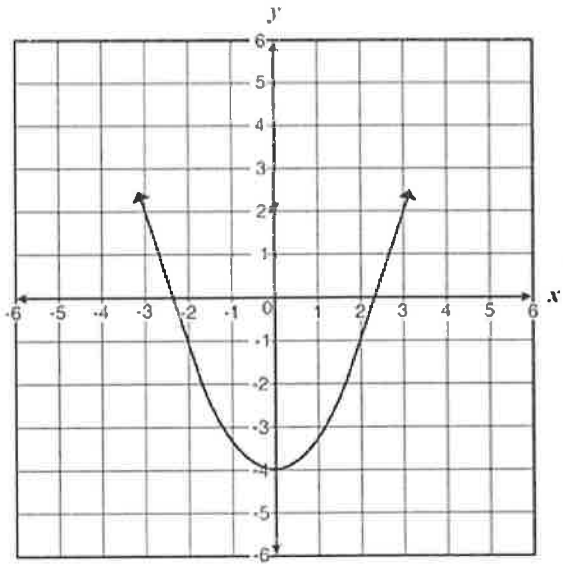
A. $y = 2x$

B. $y = 2x - 3$

C. $y = 2x + 3$

D. $y = 3x + 3$

10. **The equation $y = \frac{2}{3}x^2 - 4$ is graphed in the coordinate plane.**



up 6

If 6 is added to the equation (like $y = \frac{2}{3}x^2 - 4 + 6$), which option describes the new graph?

A. The vertex is now located at (2, 0).
B. The vertex is now located at (6, 0).
C. The vertex is now located at (0, 2).
D. The vertex is now located at (0, 6).

11. **Bill graphed $y = 3x^2 + 8$ and Joy graphed $y = 3x^2 + 4$. What statement describes the difference in the two graphs?**

A. Joy's graph is wider than Bill's graph.
B. Joy's graph is half the size of Bill's graph.
C. Joy's graph is located to the left of Bill's graph.
D. Joy's graph is located further down the *y*-axis than Bill's graph.

12. **Changing the value of *a* in $y = ax^2 + c$ to its opposite has what effect on the graph?**

A. It changes the width of the graph.
B. It changes the vertex of the graph.
C. It changes the graph's axis of symmetry.
D. It changes the direction that the graph opens.

13. The graph of $f(x) = 2x + 4$ was translated resulting in the graph of $g(x) = 2x - 5$. Which describes the translation that occurred to $f(x)$?

A. down 5 units
B. up 5 units
C. down 9 units
D. up 9 units

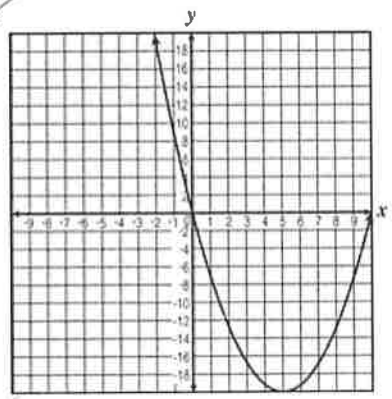
from +4 to -5

subtract 9, down 9

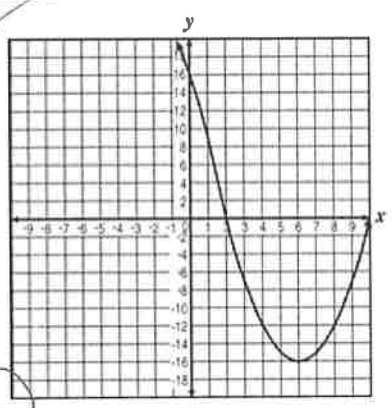
14. **Which graph BEST represents the table of x- and y-values below?**

x	y
−1	12
0	0
1	−8
3	−12
4	−8

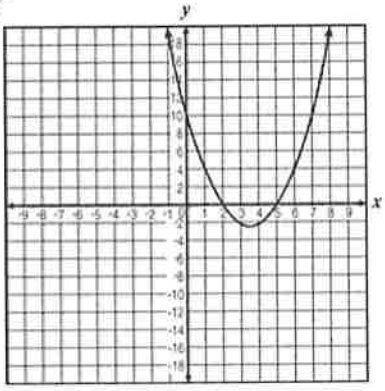
A.



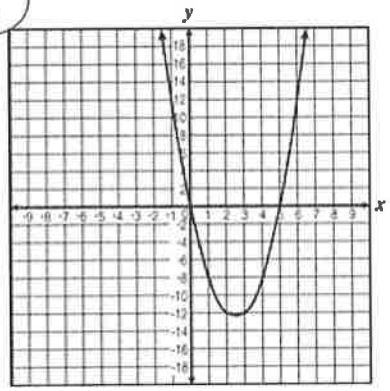
B.



C.

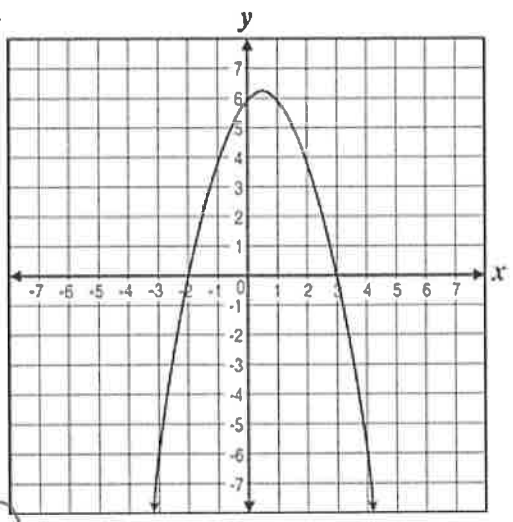


D.

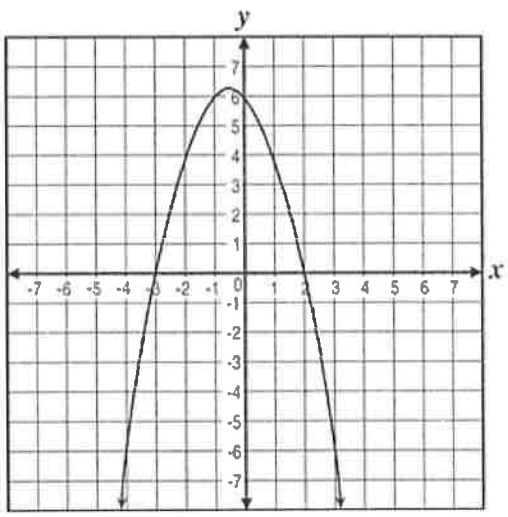


15. **The roots of the quadratic equation $x^2 - x - 6 = 0$ can be found by using which of the following?**

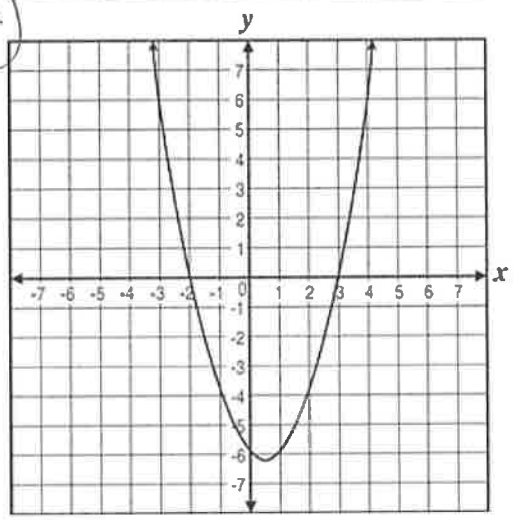
A.



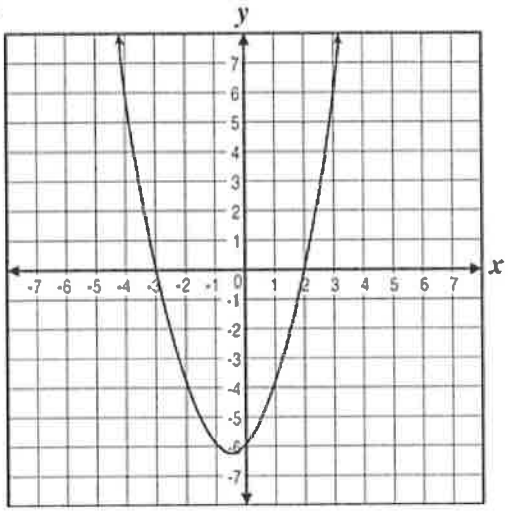
B.



C.



D.

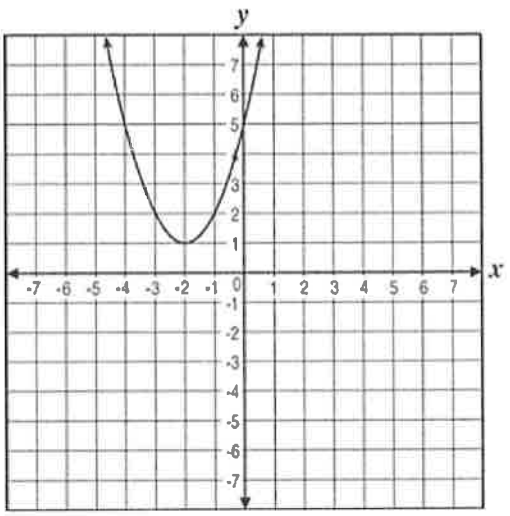


Put into $y =$ & match

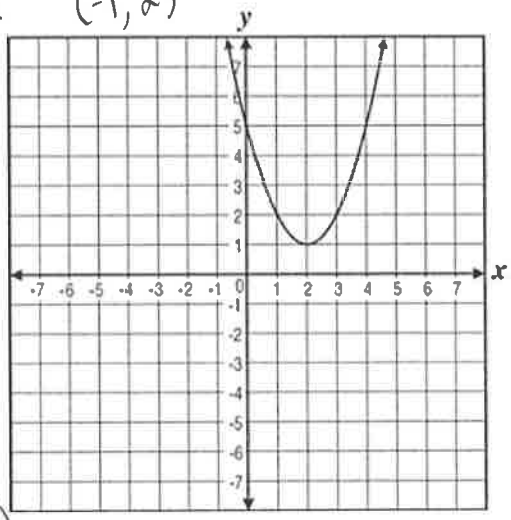
16. **Which graph represents the quadratic function** $y = (x + 1)^2 + 2$?

(-1, 2)

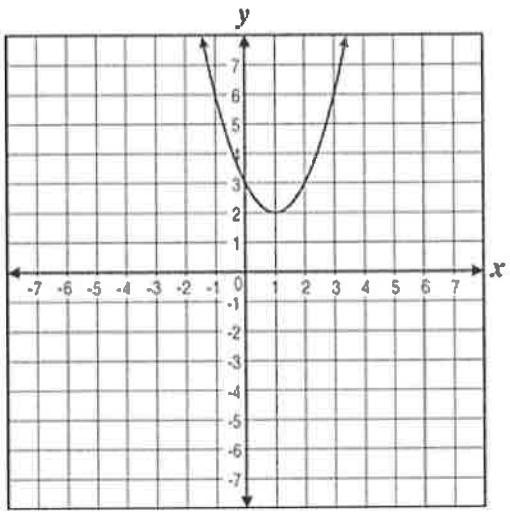
A.



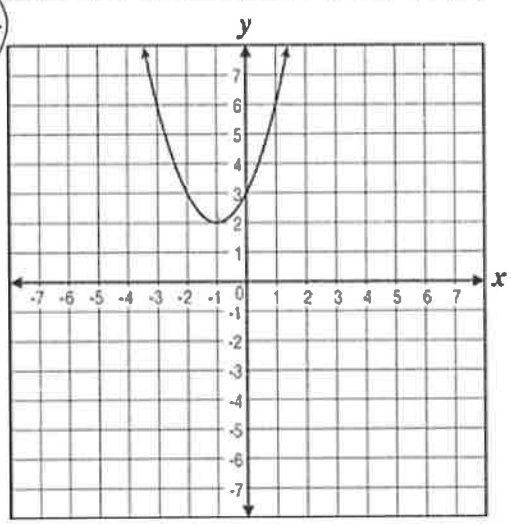
B.



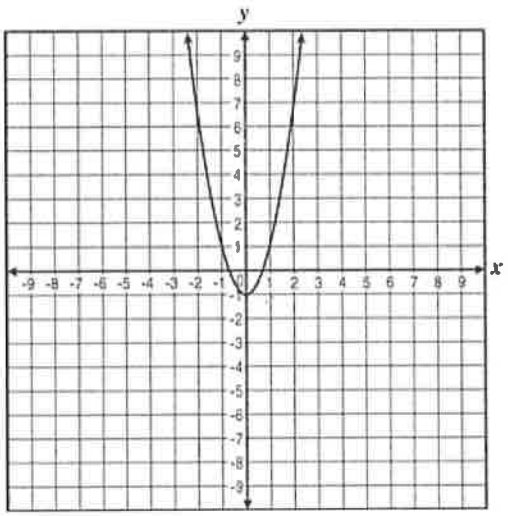
C.



D.



17. **What function is represented on this graph?**



A. $f(x) = 2x^2 - 1$

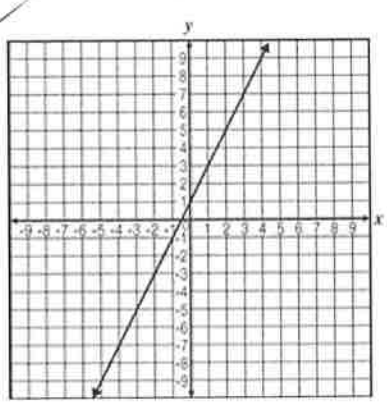
B. $f(x) = x^2 - 1$

C. $f(x) = 2x^2 + 1$

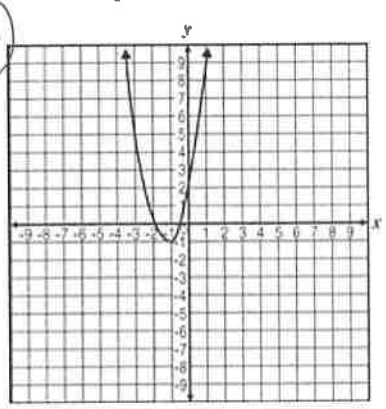
D. $f(x) = x^2 + 1$

18. **Which of the graphs below BEST represents the function** $f(x) = (2x + 1)(x + 2)$?

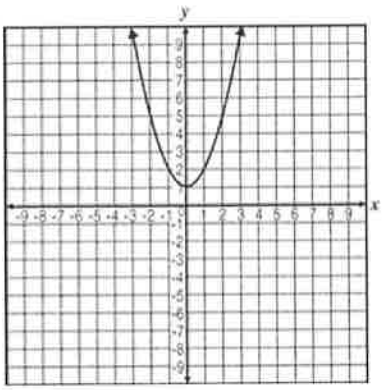
A.



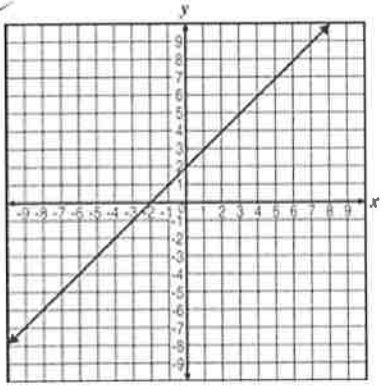
B.



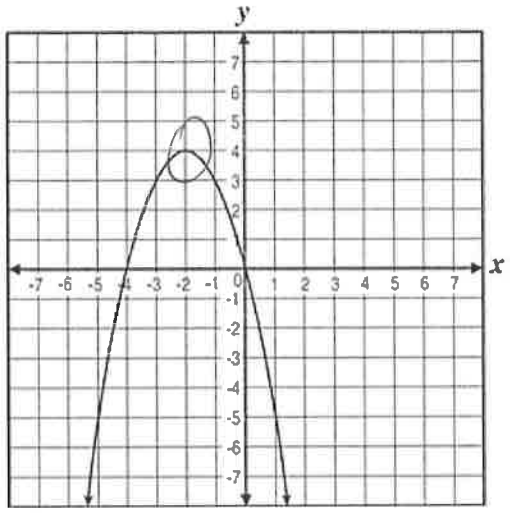
C.



D.



19. **What is the maximum of the quadratic function represented in the graph?**



A. (0, −4) and (0, 0)

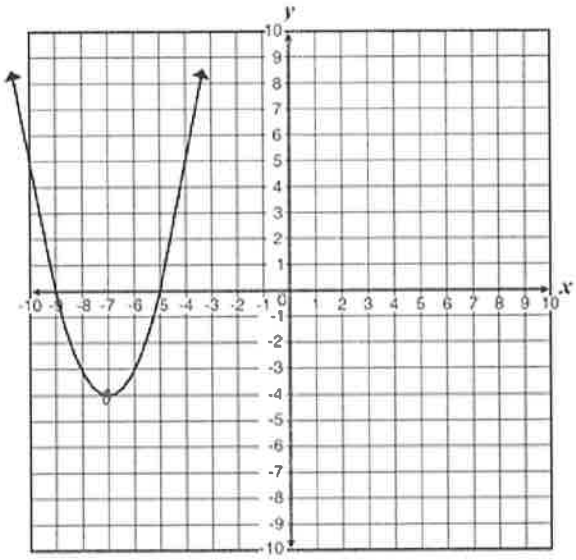
B. (0, 0)

C. (−2, 4)

D. (0, 4) and (0, 0)

(-2, 4)

20. **The graph of a quadratic equation is shown below.**



Which quadratic function matches this graph?

A. $f(x) = x^2 - 11x + 28$

B. $f(x) = x^2 + 11x + 28$

C. $f(x) = x^2 - 14x + 45$

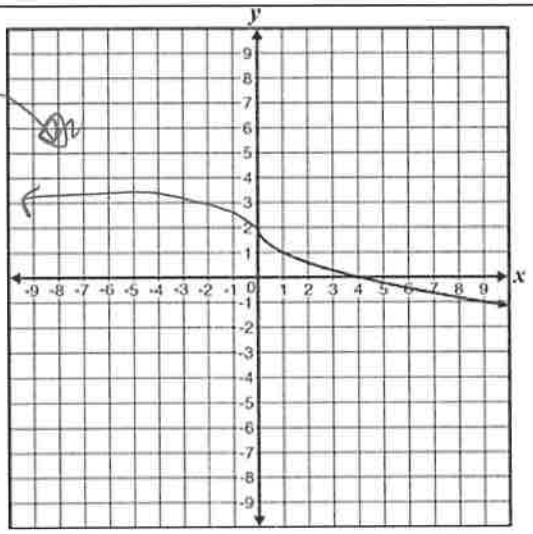
D. $f(x) = x^2 + 14x + 45$

(-7, -4)

$(x+7)^2 - 4$

$x^2 + 14x + 45$

21. **Two square root functions are shown.**

Function I	Function II
$f(x) = \sqrt{-x} + 2$	

Which statement about these two functions is true?

A. Both functions have the same maximum value.
B. Both functions have the same domain.
C. Both functions have a y-intercept of 2.
D. All of the above

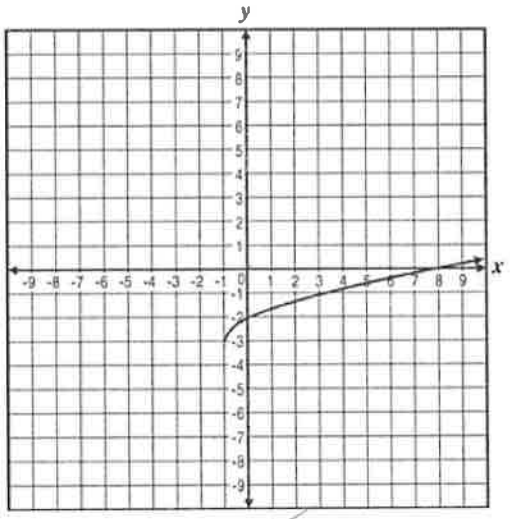
22. The city of Prairie Hills is considering building a new bridge. The chart below represents the responses of 210 registered voters who were asked their age and their opinions about the proposed bridge.

Age	In Favor	Opposed	Undecided
18-30	25	18	12
31-40	32	21	10
41-50	9	13	9
Over 50	14	32	15
	80	84	46

Dr. Edwards is a proponent of the proposal to build the bridge and wants to encourage those who agree with the proposal to get out and cast their vote. According to the data in the chart, which sort of registered voters would be most likely to support Dr.Edwards' position?

A. 18 - 30 year olds
B. 31 - 40 year olds
C. 41 - 50 year olds
D. Over 50 years old

23. **Which function is represented by this graph?**



A. $y = \sqrt{x-1} - 3$

B. $y = \sqrt{x-3} - 1$

C. $y = \sqrt{x+1} - 3$

D. $y = \sqrt{x-3} + 1$

left 1 down 3

24. **What happens to the value of y in the following equation as the value of x increases, where x is a whole number?**

$$y = x^2 + 4$$

A. The value of y approaches 0.

B. The value of y approaches $-\infty$.

C. The value of y approaches $+\infty$.

D. The value of y approaches -4.

as x increases

$y \Rightarrow \infty$

Math 2 - Fall 2017 - Function Standards Review [2097094]
SUBJECT: **Mathematics**
ADMINISTRATION DATES: **Not Scheduled**
PREFERRED STANDARDS DOCUMENT: ***Mathematics**
GRADE LEVEL: **09 - Ninth Grade - 12 - Twelfth Grade**
NUMBER OF QUESTIONS: **24**

Item #	Correct Answer	Standard ID	Point Value	Type
1	C	MA.9-12.NC.M2.F-BF.1	1	Multiple Choice
2	B	MA.9-12.NC.M2.F-BF.1	1	Multiple Choice
3	B	MA.9-12.NC.M2.F-BF.1	1	Multiple Choice
4	D	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
5	C	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
6	D	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
7	C	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
8	B	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
9	B	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
10	C	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
11	D	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
12	D	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
13	C	MA.9-12.NC.M2.F-BF.3	1	Multiple Choice
14	D	MA.9-12.NC.M2.F-IF.7	1	Multiple Choice
15	C	MA.9-12.NC.M2.F-IF.7	1	Multiple Choice
16	D	MA.9-12.NC.M2.F-IF.7	1	Multiple Choice
17	A	MA.9-12.NC.M2.F-IF.7	1	Multiple Choice
18	B	MA.9-12.NC.M2.F-IF.7	1	Multiple Choice
19	C	MA.9-12.NC.M2.F-IF.7	1	Multiple Choice
20	D	MA.9-12.NC.M2.F-IF.7	1	Multiple Choice
21	C	MA.9-12.NC.M2.F-IF.9	1	Multiple Choice
22	A	MA.9-12.NC.M2.F-IF.9	1	Multiple Choice
23	C	MA.9-12.NC.M2.F-IF.4	1	Multiple Choice
24	C	MA.9-12.NC.M2.F-IF.4	1	Multiple Choice