QUIZ DATES: _____ & _____ **TEST DATE:** _____

Math 2 Name _____

Unit 3 – Quadratic Functions Continued Date _____ Pd _____

Lesson 1 → Simplifying Square Roots

PERFECT SQUARES

NUMBER MULTIPLIED	PERFECT SQUARES	NUMBER MULTIPLIED	PERFECT SQUARES	NUMBER MULTIPLIED	PERFECT SQUARES
1 X 1 =	1	7 X 7 =	49	13 X 13 =	169
2 X 2 =	4	8 X 8 =	64	14 X 14 =	196
3 X 3 =	9	9 X 9 =	81	15 X 15 =	225
4 X 4 =	16	10 X 10 =	100	16 X 16 =	256
5 X 5 =	25	11 X 11 =	121	17 X 17 =	289
6 X 6 =	36	12 X 12 =	144	18 X 18 =	324

SQUARE ROOTS and CUBE ROOTS

Taking the square root of a number is the inverse of raising the number to the second power.

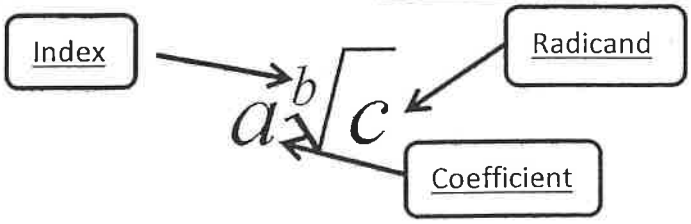
For example: If $3^2 =$ 9, then $\sqrt{9} =$ 3. For example: If $7^2 =$ 49, then $\sqrt{49} =$ 7.

Taking the cube root of a number is the inverse of raising the number to the third power.

For example: If $3^3 =$ 27, then $\sqrt[3]{27} =$ 3. For example: If $7^3 =$ 343, then $\sqrt[3]{343} =$ 7.

PARTS OF A RADICAL

An expression that contains a square root is a _____. It can have three parts.



➢ Simplify the following radical expressions.

$\sqrt{100} =$ 10 $3\sqrt{121} =$ 3·11 = 33 $-\sqrt{225} =$ -15 $-2\sqrt{144} =$ -2·12 = -24

$\sqrt{25} =$ 5 $7\sqrt{81} =$ 7·9 = 63 $\pm\sqrt{49} =$ ±7 $\pm 9\sqrt{9} =$ ± 9·3 = ±27

Math 2
Unit 3 – Quadratic Functions Continued
Lesson 1 → Simplifying Square Roots **HOMEWORK**

Name_____
Date_____ Pd_____

➢ **What is the radicand is not a perfect square but has a factor that is a perfect square?**

- Simplify: $\sqrt{24}$ = $\sqrt{4}\cdot\sqrt{6}$ $2\sqrt{6}$ $2\sqrt{6}$

What is the highest factor of 24 that is also a perfect square? ____. Therefore, 24 = ____ • ____

- Simplify: $\sqrt{32}$ = $4\sqrt{2}$ $2\cdot 2\sqrt{2}$ $4\sqrt{2}$

What is the highest factor of 32 that is also a perfect square? _____. Therefore, 32 = ____ • ____

- Simplify: $\sqrt{54}$ Prime #'s: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29...

What is the highest factor of 54 that is also a perfect square? _____. Therefore, 54 = ____ • ____

PERFECT SQUARES:

$3\sqrt{6}$ $3\sqrt{6}$

1	54
2	27
3	18
$\sqrt{6}$	$\sqrt{9}$
	$3\sqrt{6}$

➢ Classwork:

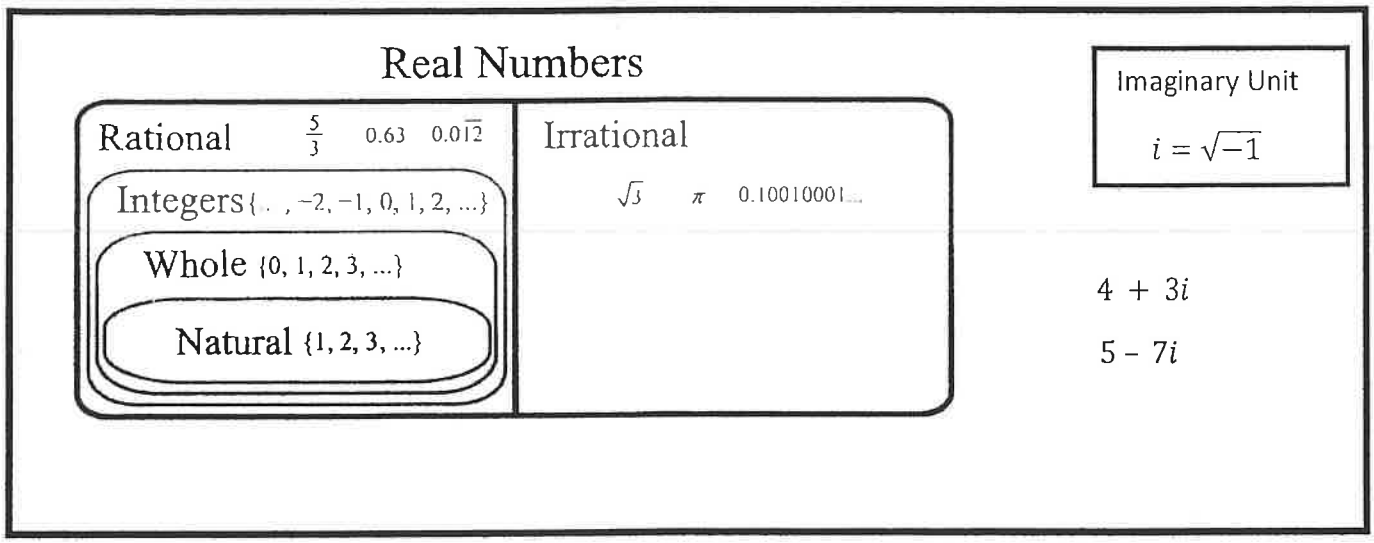
1. $\sqrt{18}$ $3\sqrt{2}$	2. $\sqrt{20}$ $2\sqrt{5}$	3. $\sqrt{40}$ $2\sqrt{10}$	4. $\sqrt{50}$ $5\sqrt{2}$	5. $\sqrt{63}$ $3\sqrt{7}$
6. $\pm\sqrt{63}$ $\pm 3\sqrt{7}$	7. $\sqrt{48}$ $4\sqrt{3}$	8. $\sqrt{98}$ $7\sqrt{2}$	9. $\sqrt{75}$ $2\cdot 5\sqrt{3}$ $10\sqrt{3}$	10. $\frac{1}{2}\sqrt{256}$ $\frac{1}{2}\cdot 16 = 8$

Math 2
Unit 3 – Quadratic Functions Continued
Lesson 1 → Simplifying Square Roots **HOMEWORK**

Name_____
Date_____ Pd_____

1. $5\sqrt{50}$	2. $3\sqrt{32}$	3. $-\sqrt{52}$	4. $\frac{1}{6}\sqrt{99}$	5. $\pm\sqrt{48}$
6. $2\sqrt{18}$	7. $-4\sqrt{12}$	8. $5\sqrt{24}$	9. $-\frac{1}{2}\sqrt{20}$	10. $5\sqrt{500}$
11. $-\sqrt{44}$	12. $12\sqrt{60}$	13. $-10\sqrt{80}$	14. $\frac{1}{2}\sqrt{8}$	15. $\pm\sqrt{12}$
16. $3\sqrt{250}$	17. $-\frac{4}{5}\sqrt{50}$	18. $\pm 7\sqrt{90}$	19. $3\sqrt{10}$	20. $\pm 3\sqrt{117}$

COMPLEX NUMBERS



COMPLEX NUMBERS: the set of numbers including the Real Numbers and the imaginary unit, i. Complex number are written in the form $a + bi$ where a is the real part and bi is the imaginary part.

IMAGINARY UNIT:

Some polynomial equations have complex (non-real) solutions, when a negative number is under the radical symbol.

For example: there is no real solution to $\sqrt{-16}$ or $\sqrt{-36}$.

Mathematicians created a new system of numbers using the imaginary unit, i, defined as $i = \sqrt{-1}$. With this new system of numbers, radicals of negative numbers can now be simplified!

Therefore: $i = \sqrt{-1}$

Simplify:

$\sqrt{-16} =$ $4i$

$\sqrt{-20} =$ $2i\sqrt{5}$

$\sqrt{-45} =$ _____

$\sqrt{-36} =$ $6i$

$\sqrt{-27} =$ _____

$\frac{5\sqrt{-75}}{3} =$ $\frac{5i\sqrt{3}}{5i\sqrt{3}}$ $5i\sqrt{3}$

Math 2
Unit 3 – Quadratic Functions Continued
Lesson 2 → Sets of Numbers **HOMEWORK**

Name_____
Date_____ Pd_____

➢ Determine whether each number is **rational** or **irrational**:

6	$\frac{5}{6}$	$\sqrt{6}+\sqrt{3}$	$1-\pi$	$5+\sqrt{6}$
$0.\overline{6}$	π	$\frac{\pi}{2}$	$\frac{\sqrt{6}}{\sqrt{3}}$	0.45
-6	$0.456789\ldots$	$4+\sqrt{3}$	0	$0.\overline{273}$

➢ Express each number in terms of i and then **simplify**:

1. $\sqrt{-36}$	2. $\sqrt{-100}$	3. $-\sqrt{-81}$	4. $2\sqrt{-49}$
5. $\frac{1}{8}\sqrt{-64}$	6. $\frac{-2}{3}\sqrt{-9}$	7. $\frac{3}{4}\sqrt{-144}$	8. $\frac{1}{3}\sqrt{-25}$
9. $\sqrt{-\frac{1}{4}}$	10. $\sqrt{-\frac{16}{25}}$ $i\cdot\frac{4}{5}$ $\frac{4}{5}i$	11. $4\sqrt{-\frac{49}{64}}$ $\frac{4}{1}\cdot i\cdot\frac{7}{8}$ $\frac{28}{8}i$ $7/2\,i$	12. $\frac{3}{5}\sqrt{-\frac{100}{9}}$
13. $\sqrt{-3}$	14. $\sqrt{-29}$	15. $3\sqrt{-11}$	16. $-\sqrt{-10}$ $-i\sqrt{10}$
17. $\sqrt{-20}$	18. $-\sqrt{-28}$ $-i$ $-i\cdot 2\sqrt{7}$ $2\,\|\,28$ $2\,\|\,14$ $2\,\|\,7$ $-2i\sqrt{7}$	19. $2\sqrt{-75}$ $2\cdot i$ $2\cdot 5i\sqrt{3}$ $10i\sqrt{3}$ $5\,\|\,75$ $3\,\|\,15$ 5	20. $5\sqrt{-8}$
21. $3\sqrt{-98}$	22. $-2\sqrt{-75}$	23. $\pm\sqrt{-45}$	24. $\frac{3\sqrt{7}}{\sqrt{-28}}$