$4x^2$

QUIZ DATES: _____ & _____

Math 2 – Honors

Unit 3 – Quadratic Functions Continued

Lesson 1 → Simplifying Square Roots

TEST DATE: _____

Name_____

Date_____Pd_____

PERFECT SQUARES

NUMBER MULTIPLIED	PERFECT SQUARES	NUMBER MULTIPLIED	PERFECT SQUARES	NUMBER MULTIPLIED	PERFECT SQUARES	NUMBER MULTIPLIED	PERFECT SQUARES
1 X 1 =	1	6 X 6 =	36	11 X 11 =	121	16 X 16 =	256
2 X 2 =	4	7 X 7 =	49	12 X 12 =	144	17 X 17 =	289
3 X 3 =	9	8 X 8 =	64	13 X 13 =	169	18 X 18 =	324
4 X 4 =	16	9 X 9 =	81	14 X 14 =	196	19 X 19 =	361
5 X 5 =	25	10 X 10 =	100	15 X 15 =	225	20 X 20 =	400

Taking the square root of a number is the **inverse** of raising the number to the second power.
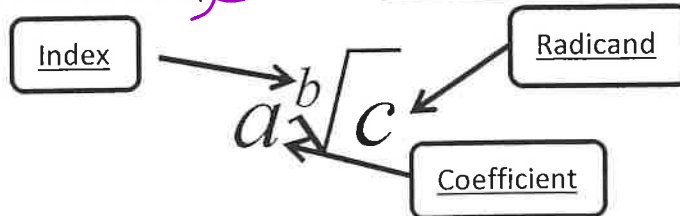
SQUARE ROOTS and CUBE ROOTS

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

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

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

PARTS OF A RADICAL

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

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Radicand

$$a\sqrt[b]{c}$$

Coefficient

> Simplify the following radical expressions.

$\sqrt{100} = \underline{10}$

$3\sqrt{121} = \underline{3 \cdot 11 = 33}$

$-\sqrt{225} = \underline{-15}$

$-2\sqrt{144} = \underline{2 \cdot 12 = -24}$

$\sqrt{25} = \underline{5}$

$7\sqrt{81} = \underline{7 \cdot 9 = 63}$

$\pm\sqrt{49} = \underline{\pm 7}$

$\pm 9\sqrt{9} = \underline{\pm 9 \cdot 3 = \pm 27}$

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

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

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

- Simplify: $\sqrt{32}$ = $4\sqrt{2}$ $\sqrt{16\cdot 2}$ $4\sqrt{2}$

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

- Simplify: $\sqrt{54}$

  1. 54
  2. 27
  3. 18

  $\sqrt{9}$ $\sqrt{6}$ $3\sqrt{6}$

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

  4.

  $10\cdot10$

➤ Classwork:

1. $\sqrt{18}$	2. $\sqrt{20}$	3. $\sqrt{40}$	4. $\sqrt{50}$	5. $\sqrt{63}$
$3\sqrt{2}$	$2\sqrt{5}$	$2\sqrt{10}$ 5|40 2|8 4 2	2|50 5|25 5 $5\sqrt{2}$	$3\sqrt{7}$
6. $\pm\sqrt{63}$	7. $\sqrt{48}$	8. $\sqrt{98}$	9. $\sqrt{75}$	10. $\sqrt{256}$
$\pm3\sqrt{7}$	$4\sqrt{3}$	2|98 7|49 $7\sqrt{2}$	$5\sqrt{3}$	16
11. $2\sqrt{18}$	12. $-4\sqrt{12}$	13. $5\sqrt{24}$	14. $\frac{-1}{2}\sqrt{20}$	15. $5\sqrt{500}$
$2\cdot 3\sqrt{2}$ $6\sqrt{2}$	$2\|12$ $2\|6$ 3 $-4\cdot2\sqrt{3}$ $\boxed{-8\sqrt{3}}$	$5\cdot 2\cdot\sqrt{6}$ $10\sqrt{6}$	$2\|20$ $2\|10$ 5 $-\frac{1}{2}\cdot2\sqrt{5}$ $\boxed{-\sqrt{5}}$	$5\cdot\sqrt{100}\cdot\sqrt{5}$ $5\cdot10\cdot\sqrt{5}$ $5\cdot10\sqrt{5}$ $\boxed{50\sqrt{5}}$ $50\sqrt{5}$
16. $-\sqrt{44}$	17. $12\sqrt{60}$	18. $-10\sqrt{80}$	19. $\frac{1}{2}\sqrt{8}$	20. $\pm\sqrt{12}$
$-2\sqrt{11}$	$12\sqrt{15}\cdot\sqrt{4}$ $24\sqrt{15}$	$-40\sqrt{5}$ $-10\cdot4\sqrt{5}$ $-40\sqrt{5}$	$\sqrt{2}$	$\pm2\sqrt{3}$
21. $3\sqrt{250}$	22. $-\frac{4}{5}\sqrt{50}$	23. $\pm7\sqrt{90}$	24. $3\sqrt{10}$	25. $\pm2\sqrt{117}$
$15\sqrt{10}$	$-4/5\cdot5\sqrt{2}$ $-4\sqrt{2}$	$\pm21\sqrt{10}$	$3\sqrt{10}$	$\pm6\sqrt{13}$
26. $\sqrt{x^2}$	27. $\sqrt{16x^2}$	28. $\sqrt{9x^3}$	29. $\sqrt{27x^4}$	30. $\sqrt{48x^3}$
X	$4x$	$3x\sqrt{x}$	$3\sqrt{3}$ $3x^2\sqrt{3}$ $3\|27$ $3\|9$ 3	$4x\sqrt{3x}$

5\|500 ... 2

$\sqrt{3\cdot3\cdot x\cdot x\cdot x}$

$\sqrt{24}$

$\boxed{2\sqrt{6}}$

$\begin{array}{c|c} 2 & 24 \\ \hline 2 & 12 \\ \hline 3 & 6 \\ \hline & 2 \end{array}$

$\sqrt{32}$

$4\sqrt{2}$

$\begin{array}{c|c} 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline & 2 \end{array}$

$\sqrt{54}$

$3\sqrt{6}$

$\begin{array}{c|c} 3 & 54 \\ \hline 3 & 18 \\ \hline 3 & 6 \\ \hline & 2 \end{array}$