LOS:

$$x = \frac{-b}{2a}$$

Vertex

(x,y)

A company wants to maximize its profits by selling radios. The following equation gives the profit as a function of the number of hours the assembly line is operating each day.

$$P(h) = -48h^2 + 1800h - 1560$$

max vertex (x, y) (h, P)

1. Find the maximum profit the company can make. Round to the nearest hundredth as needed.

y coord. $15,315

2. Find the number of hours the assembly line should be operating daily to reach this maximum profit.

x coord.

$$h = \frac{-1800}{2(-48)} = 18.75$$

$y = ax^2 + c$

a
- determines if parabola opens up or down
- determines if parabola is wide or narrow

c
- moves parabola up and down and thus affects the y-coordinate of the vertex.
- y-int

No Horizontal Shift

LOS is: x = 0 Vertex is (0, c)

$y = ax^2 + bx + c$

a
- determines if parabola opens up or down
- determines if parabola is wide or narrow
- Helps find the LOS

b
- Moves parabola left and right
- determines the location of the LOS and thus the x coordinate of the Vertex

LOS:

$$x = \frac{-b}{2a}$$

c
- moves parabola up and down and thus affects the y-coordinate of the vertex.
- y-int

3. Graph this parabola using at least five points.

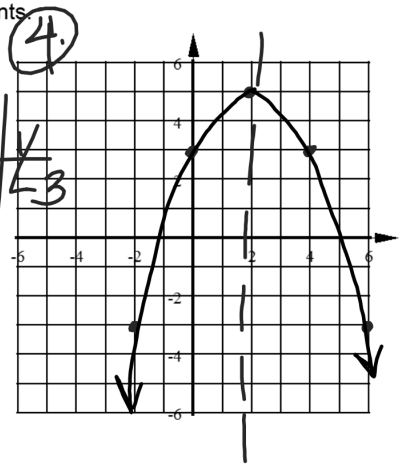
Use only integer values to graph!

$y = -\frac{1}{2}x^2 + 2x + 3$

1. LOS $x=2$
2. $(2,5)$
3. $y=3$

x	y
6	-3

4.



Simplify each.

4. $\sqrt{576}$ 24

5. $\sqrt{384}$ $\sqrt{64 \cdot 6} = 8\sqrt{6}$

6. $\sqrt{112}$ $\sqrt{16 \cdot 7}$ $= 4\sqrt{7}$

7. $\sqrt{343}$ $\sqrt{49 \cdot 7} = 7\sqrt{7}$

Every positive number has how many square roots? 2 real roots

Every negative number has how many square roots? No real roots

What is the only number that has ONE real square root? Zero

Find the real square roots of each number

1. $\frac{81}{169}$ $\pm \frac{9}{13}$
2. -144 No Real Square Roots
3. 729 ± 27
4. 0.0064 ± 0.08

What is each problem asking for?

1. $-\sqrt{25}$ The negative Square Root of 25.

2. $\pm\sqrt{25}$ Both the positive and negative Square Root of 25.

3. $\sqrt{25}$ The positive Square Root of 25. Also known as the Principal Square Root.

The Principal Root:

When there is more than one root of a number the Principal Root is the Positive Root.

Simplify each.

1. $\pm\sqrt{441}$ ± 21
2. $\sqrt{\frac{4}{49}}$ $\frac{2}{7}$
3. $-\sqrt{225}$ -15
4. $\sqrt{-9}$ No Real roots

Without using a calculator estimate each square root as being between what consecutive integers.

1. $\sqrt{40}$ Between 6 and 7 (36 and 49)
2. $\sqrt{79}$ Between 8 and 9
3. $\sqrt{13}$ Between 3 and 4

If $x^2 = 49$ how would you solve for x?

Undo squaring by taking the square root of both sides.

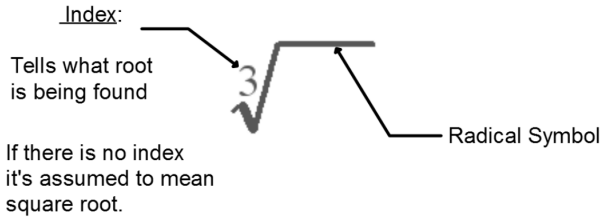
Squaring and Square Roots are inverses of each other.

What are the solutions?

$x = \pm 7$

if $x^3 = 8$ then the value of x is found by doing the "cube root" of 8.

In symbols: $\sqrt[3]{8}$



Solve. $\frac{5x^2}{5} = \frac{80}{5}$

$x^2 = 16$

$x = \pm 4$

A square has an area of 256 square inches. Find the length of each side of the square.

$A = s^2$ $\quad 256 = s^2$

$s = 16$

Find the solutions to this equation.

$11 - 4x^2 = 47$

$-4x^2 = 36$

$x^2 = -9$

When the book says to find solutions it means find all REAL solutions.

When they write no solution it means NO REAL solution.

Find all real solutions to each equation using square roots. Simplify irrational answers.

1. $3x^2 - 7 = 5$

$+7 \quad +7$

$\frac{3x^2}{3} = \frac{12}{3}$

$\sqrt{x^2} = \sqrt{4}$

$x = \pm 2$

2. $120 - 5x^2 + 9 - x^2 = 33$

$129 - 6x^2 = 33$

$\frac{-6x^2}{-6} = \frac{-96}{-6}$

$x^2 = 16$

$x = \pm 4$

3. $18x^2 + 13 = 111$

$18x^2 = 98$

$x^2 = \frac{98}{18} = \frac{49}{9} = \pm\frac{7}{3}$

4. $2x^2 - 21 = 27$

$2x^2 = 48$

$x^2 = 24$

$\sqrt{24}$

$x = \sqrt{4 \cdot 6} = \pm 2\sqrt{6}$

5. $\frac{1}{3}x^2 - 9 = 7$

$3 \cdot \frac{1}{3}x^2 = 16 \cdot 3$

$x^2 = 48$

$x = \sqrt{16 \cdot 3} = \pm 4\sqrt{3}$

6. $(x + 3)^2 + 8 = 33$

$\sqrt{(x+3)^2} = \sqrt{25}$

$x + 3 = \pm 5$

$x = 2, -8$

You can now finish Hwk #26 Sec 10-3

Pages 526-527 Due tomorrow

Problems: 10-12, 21, 22, 26-28