Solve. $x^2 = 9$

This equation is asking you to find ALL the numbers that could be squared and equal 9.

$x = 3$ and -3

What numbers could you square and get 25? ± 5

What are the square roots of 100? ± 10

Solve. $x^2 = 49$ $x = \pm 7$

There are two square roots of every positive number.

When you are solving for x in an equation with x^2 or $(x\ \ )^2$ you want ALL the values of x that make the equation true.

Therefore, when solving an equation by taking the square root of a positivenumber you must include $\pm$

You could solve this quadratic equation by factoring or using square roots. Solve this equation.

FACTORING

$45v^2 - 80 = 0$

$5(9v^2 - 16) = 0$

$5(3v \pm 4) = 0$

$v = \pm \frac{4}{3}$

SQ ROOTS

$45v^2 - 80 = 0$

$+80 \quad +80$

$45v^2 = 80$

$v^2 = \frac{80}{45}$

$\sqrt{v^2} = \sqrt{\frac{16}{9}}$

$v = \pm \frac{4}{3}$

Why can I solve $18x^2 - 50 = 0$ using Square Roots

BUT,

I CAN'T solve $18x^2 + 5x - 2 = 0$ using Square Roots

When a quadratic has a linear term (bx) then you can't solve using square roots.

Solving Quadratic Equations with Square Roots:

You can use Square Roots to solve a Quadratic Equation ONLY IF

- The equation is in Standard Form and there is no linear term (b = 0)
- The equation is in Vertex Form $y = a(x-h)^2 + k$

Steps to follow if solving using square roots:

1. Isolate x^2 or $(x\ \ )^2$ on one side of the equation
2. Take the square root of both sides $\pm$
3. Finish solving for x (if necessary)

Simplify each.

1. $\sqrt{98} = \sqrt{49 \cdot 2}$
$= 7\sqrt{2}$

2. $\sqrt{117} = \sqrt{9 \cdot 13}$
$= 3\sqrt{13}$

3. $\sqrt{240}$
$= \sqrt{16 \cdot 15}$
$= 4\sqrt{15}$

Find the exact solutions to this equation.

1. $6x^2 - 7 = 281$
$+7 \quad +7$

$\frac{6x^2}{6} = \frac{288}{6}$

$\sqrt{x^2} = \sqrt{48}$

$x = \pm\sqrt{48} = \pm\sqrt{16 \cdot 3}$

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

Find the solution to this equation. Round to the nearest hundredth if necessary.

2. $6x^2 + 3 = 129$

$-3 \quad -3$

$\frac{6x^2}{6} = \frac{126}{6}$

$\sqrt{x^2} = \sqrt{21}$

$x = \pm 4.58$

What are the solutions to this equation?

$x^2 + 81 = 0$

$-81 \quad -81$

$\sqrt{x^2} = \sqrt{-81}$

No Real Solutions

Find the exact solutions to each by using Square Roots.

1. $2(x + 3)^2 - 8 = 0$

$+8 \quad +8$

$\frac{2(x+3)^2}{2} = \frac{8}{2}$

$\sqrt{(x+3)^2} = \sqrt{4}$

$x + 3 = \pm 2$

$-3 \quad -3$

$+2 - 3 = -1$

$-2 - 3 = -5$

Find the exact solutions to each by using Square Roots.

2. $6(x - 1)^2 + 2 = 32$

$-2 \quad -2$

$\frac{6(x-1)^2}{6} = \frac{30}{6}$

$\sqrt{(x-1)^2} = \sqrt{5}$

$x - 1 = \pm\sqrt{5}$

$+1 \quad +1$

$x = 1 \pm \sqrt{5}$

You can now finish Hwk #12

Sec 5-5

Due tomorrow

Page 270

Problems 7, 10, 11, 14, 15, 42, 43, 50, 51