Solving Radical Equations

In This Unit:

Solving Radical Equations

Bellwork
04/26/2012

Graph the quadratic.

1. $y = 3x^2 - 12x + 4$

x	y
1	-5
0	4

$a = 3 \quad b = -12 \quad c = 4$

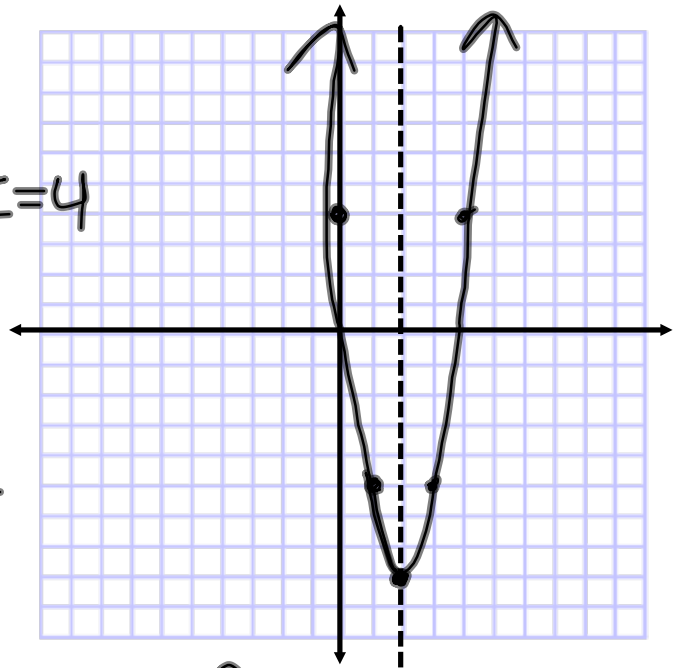$x = \dfrac{-b}{2a}$

$x = \dfrac{12}{2(3)} = \dfrac{12}{6}$

$x = 2$

$(2, -8)$

$y = 3(1)^2 - 12(1) + 4$
$y = 3 - 12 + 4$
$y = -5$

$y = 3(0)^2 - 12(0) + 4$
$y = 4$

$y = 3(2)^2 - 12(2) + 4$
$3(4) - 12(2) + 4$
$12 - 24 + 4$
$y = -8$

Lesson 15.1
Solving Radical Equations

What You Need to Know:

Remember the opposite of a square is a square root.

To get rid of a square root, you square BOTH sides of the equation.

But FIRST, move everything away (to the other side of the =) from the square root.

REMEMBER: $(x+2)^2 = (x+2)(x+2)$

An extraneous is a solution that does NOT check correctly.

Solving Radical Equations

Solve the equation. Check for extraneous solutions.

$\sqrt{x+2}=3$

$\sqrt{7+2}=3$
$\sqrt{9}=3$

$x+2=9$
$-2-2$
$x=7$ Extraneous!

$\sqrt{x}+2=3$

$\sqrt{1}+2=3$
$1+2=3$
$3=3\checkmark$

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

$\sqrt{4x+1}=3$

$\sqrt{4(2)+1}=3$
$\sqrt{8+1}=3$
$\sqrt{9}=3$
$\pm3=3$

$4x+1=9$
$-1-1$
$\dfrac{4x}{4}=\dfrac{8}{4}$
$x=2$

Extraneous!

$\sqrt{x-1}+3=x-3$

-3
$x(\sqrt{x-1})=(x-3)^2$
$x-1=(x-3)(x-3)$

$x-1=x^2-3x-3x+9$
$x-1=x^2-6x+9$
$+1+1$
$-x=x^2-6x+10$
$-1x$
$0=x^2-7x+10$

$0=(x-5)(x-2)$

$x-5=0$ $x-2=0$
$\boxed{x=5}$ $x=2$

$\sqrt{5-1}+3=5$ $\sqrt{2-1}+3=2$
$\sqrt{4}+3=5$ $\sqrt{1}+3=2$
$2+3=5$ $1+3=2$
$5=5\checkmark$ $4=2$ X

$\sqrt{3x+6}=0$

$-6-6$
$x(\sqrt{3x})=(-6)^2$
$\dfrac{3x}{3}=\dfrac{36}{3}$
$x=12$

$\sqrt{3(12)}+6=0$
$\sqrt{36}+6=0$
$6+6=0$
$12=0$

Extraneous!

$(\sqrt{x+6}=x)^2$

$x+6=x^2-x-6$
$-x-6-x-6$
$0=x^2-x-6$
$0=(x+2)(x-3)$

$x+2=0$ $x-3=0$
$-2-2$ $+3+3$
$x=-2$ $x=3$

$\sqrt{-2+6}=-2$
$\sqrt{4}=-2$
$\pm2=-2$

$\sqrt{3+6}=3$
$\sqrt{9}=3$
$\pm3=3$

Extraneous!

Homework Assignment

Worksheet
"Solving Radical Equations"