Solving Equations Graphically, Numerically and Algebraically

- Solving Equations Graphically
- Solving Quadratic Equations
- Approximating Solutions of Equations Graphically
- Solving Equations by Finding Intersections

~These basic techniques are involved in using a graphing utility to solve equations in this textbook

Sections P5: HW: Pg. 46 #'s 1, 6, 20, 21, 40, 48, 49

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Solving by Finding x-Intercepts

Solve the equation graphically. Confirm algebraically.

$$2x^2 - 3x - 2 = 0$$

$$(2x+1)(x-2) = 0$$

$2x+1=0$

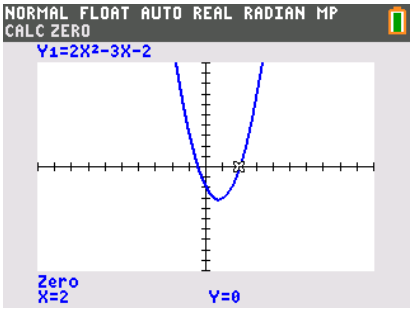
$-1 \quad -1$

$2x = -1$

$x = -\frac{1}{2}$

$x-2=0$

$x=2$



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Solving by Extracting Square Roots

Solve algebraically

$$(2x - 1)^2 = 9$$

$2x - 1 = \pm 3$

$2x - 1 = 3$ $\quad +1 \quad +1$

$2x = 4$

$x = 2$ ✓

$2x - 1 = -3$ $\quad +1 \quad +1$

$2x = -2$

$x = -1$ ✓

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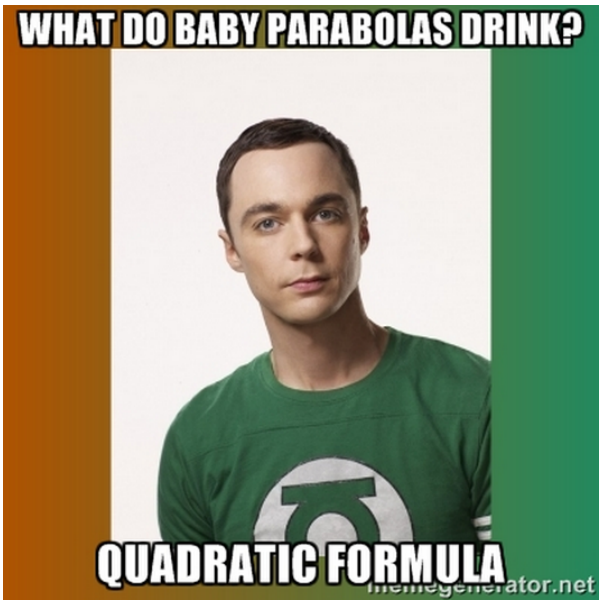

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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Using the Quadratic Formula

Solve

$$3x^2 - 6x = 5$$

$$3x^2 - 6x - 5 = 0$$

$A = 3$, $B = -6$, $C = -5$

$$\frac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(-5)}}{2(3)}$$

$$\frac{6 \pm \sqrt{36 - -60}}{6}$$

$$\frac{6 \pm \sqrt{96}}{6}$$

$\sqrt{96} = \sqrt{16}\sqrt{6}$

$4\sqrt{6}$

$$= \frac{6 \pm 4\sqrt{6}}{6}$$

$$\frac{3 \pm 2\sqrt{6}}{3}$$

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Solve Using Tables

Approximate the solutions to the equation using your table function

$$x^3 - x - 1 = 0$$

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Solving by Finding Intersections

Solve the equation

$$|2x - 1| = 6$$

2nd | 0 abs(

MATH | NUM | 1 abs(

$x = -2.5$

$x = 3.5$

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3) $4x^2 - 8x + 3$

	$2x$	-1
$(2x-1)\ 2x$	$4x^2$	$-2x$
$(2x-1)\ -3$	$-6x$	3

$3 \cdot 4 = 12$

1 12

2 6

3 4

$(2x-1)(2x-3)$

$4x^2 - 6x - 2x + 3$

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6) $x(3x+11)=20$

$3x^2+11x=20$

$3x^2+11x-20=0$

$3x^2$	$15x$
$-4x$	-20

$3x(x+5)$

$-4(x+5)$

$(3)(-20)=-60$

1 60
2 30
3 20
4 15

$(x+5)(3x-4)=0$

$x+5=0$ $3x-4=0$

$x=-5$ $3x=4$

$x=4/3$

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$x^2-18=0$

$x^2=18$

$x=\pm\sqrt{18}$ $\sqrt{18}=\sqrt{9}\sqrt{2}$

$=3\sqrt{2}$

$x=\pm 3\sqrt{2}$

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9) $\frac{3(x+4)^2}{3} = \frac{8}{3}$

$(x+4)^2 = \frac{8}{3}$

$x+4 = \pm\sqrt{\frac{8}{3}}$

$-4 \qquad -4$

$x = \sqrt{\frac{8}{3}} - 4$ and $x = -\sqrt{\frac{8}{3}} - 4$

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12) $(2x+3)^2 = 169$

$2x+3 = \pm\sqrt{169}$

$2x+3 = \pm 13$

$2x+3 = 13$ $\qquad$ $2x+3 = -13$

$-3 \quad -3$ $\qquad$ $-3 \quad -3$

$2x = 10$ $\qquad$ $2x = -16$

$x = 5$ $\qquad$ $x = -8$

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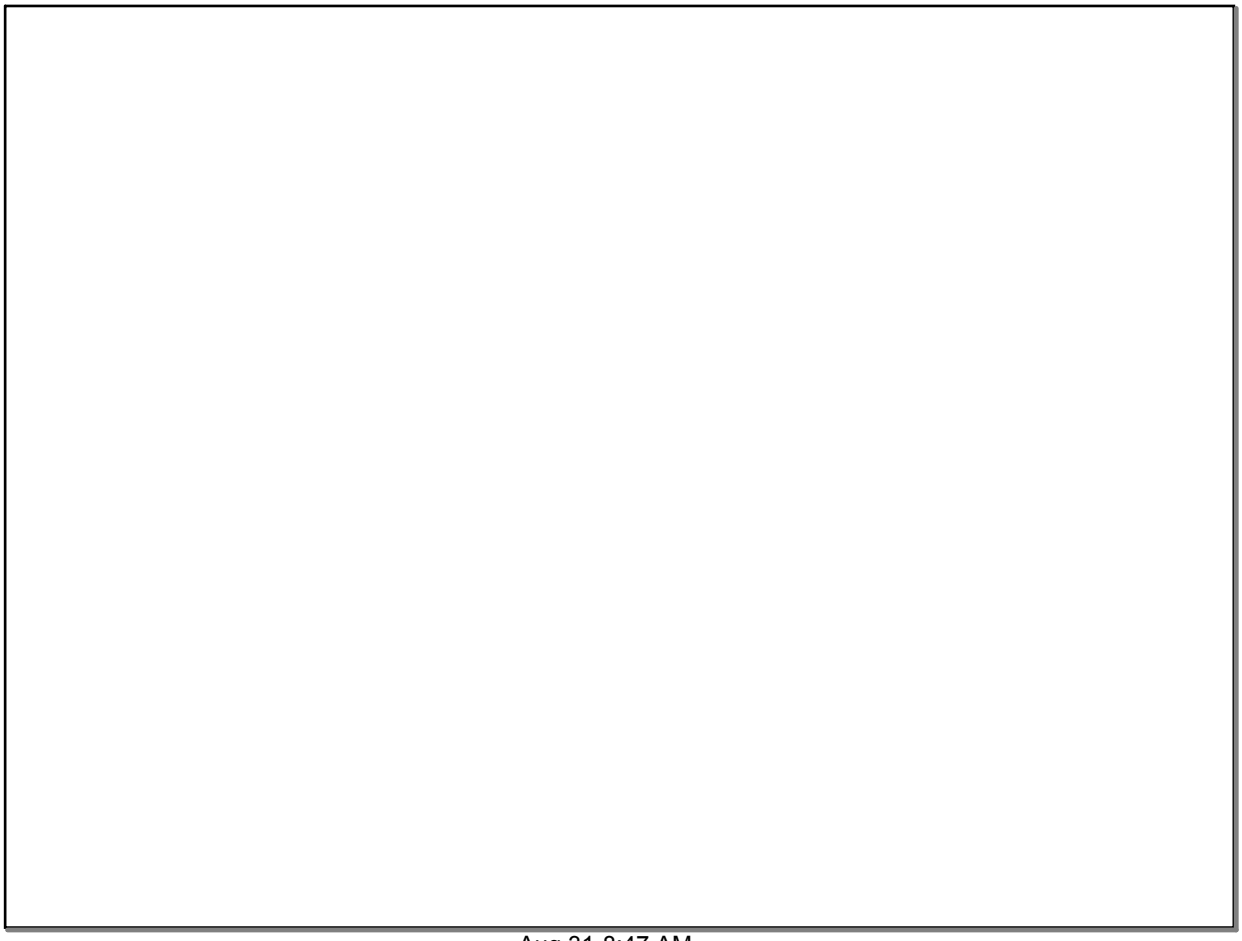

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