

SAT

1-5 Solving Quadratic Functions
Day 1

Solve by factoring

If $(x - a)(x - b) = 0$, then

$$x - a = 0 \quad \text{or} \quad x - b = 0$$

$$x = a \text{ or } x = b$$

$$x^2 - 9x + 20 = 0$$

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

$$x-4=0 \quad \text{or} \quad x-5=0$$

$$x=4 \quad x=5$$

Solve by factoring

If $(x - a)(x - b) = 0$, then

$$x - a = 0 \quad \text{or} \quad x - b = 0$$
$$x = a \text{ or } x = b$$

$$4x^2 + 20x + 24 = 0$$

$$4(x^2 + 5x + 6) = 0$$

$$4(x+3)(x+2) = 0$$

$$x+3=0 \quad \text{or} \quad x+2=0$$

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

Solve by factoring

If $(x - a)(x - b) = 0$, then

$$x - a = 0 \quad \text{or} \quad x - b = 0$$

$$x = a \text{ or } x = b$$

$$4x^2 - 5x = 0$$

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

$$x = 0$$

$$\text{or } 4x - 5 = 0$$

$$4/x = 5$$

$$x = \frac{5}{4}$$

Solve by factoring

If $(x - a)(x - b) = 0$, then

$$x - a = 0 \quad \text{or} \quad x - b = 0$$

$$x = a \text{ or } x = b$$

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

$$x+6 = x^2$$

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

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

$$x-3=0 \quad \text{or} \quad x+2=0$$

$$x=3 \quad \text{or} \quad x=-2$$

Solve by taking square roots

If $(x - a)^2 = b$, then

$$x - a = \pm\sqrt{b}$$

$$x = a \pm\sqrt{b}$$

$$x^2 - 8 = 0$$

$$\sqrt{x^2} = \sqrt{8}$$

$$x = \pm\sqrt{8}$$

Solve by taking square rootsIf $(x - a)^2 = b$, then

$$x - a = \pm\sqrt{b}$$

$$x = a \pm\sqrt{b}$$

$$(2x - 1)^2 - 9 = 0$$

$$\sqrt{(2x-1)^2} = \sqrt{9}$$

$$2x - 1 = \pm 3$$

$$\frac{2x}{2} = \frac{1 \pm 3}{2}$$

$$\rightarrow x = \frac{1+3}{2} = \boxed{2}$$

or

$$x = \frac{1-3}{2} = \boxed{-1}$$

Solve by taking square roots

If $(x - a)^2 = b$, then

$$x - a = \pm\sqrt{b}$$

$$x = a \pm\sqrt{b}$$

$$\frac{5(x+7)^2}{5} = \frac{100}{5}$$

$$\sqrt{(x+7)^2} = \pm\sqrt{20}$$

$$x+7 = \pm\sqrt{20}$$

$$x = -7 \pm\sqrt{20}$$

Solve by taking square roots

If $(x - a)^2 = b$, then

$$x - a = \pm\sqrt{b}$$

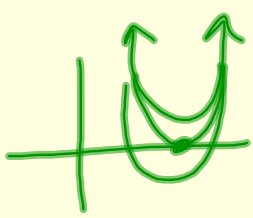
$$x = a \pm\sqrt{b}$$

$$4x^2 - 15 = 0$$

$$4x^2 = 15$$

$$\sqrt{x^2} = \sqrt{\frac{15}{4}}$$

$$x = \pm\sqrt{\frac{15}{4}}$$



Solve by quadratic formula

If $ax^2 + bx + c = 0$, then

$$(x-3)(x-3) = 0$$

$$x-3$$

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

→ discriminant

+ → 2 ans.

0 → 1 answer

- → no solution

$$x^2 - 6x = -9$$

$$\overset{a}{1}x^2 - \overset{b}{6}x + \overset{c}{9} = 0$$

$$x = \frac{6 \pm \sqrt{(-6)^2 - 4(1)(9)}}{2(1)}$$

$$= \frac{6 \pm \sqrt{0}}{2} = \textcircled{3}$$

Solve by quadratic formulaIf $ax^2 + bx + c = 0$, then

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

$$8x^2 - 24x + 18 = 0$$

$$2(4x^2 - 12x + 9) = 0$$

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

$$b^2 - 4ac = 0$$

 \downarrow solution!

Solve by quadratic formulaIf $ax^2 + bx + c = 0$, then

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

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

$$\begin{aligned} &\rightarrow (-2)^2 - 4(3)(5) \\ &= 4 - 60 = \underline{\underline{-56}} \end{aligned}$$

No solution

No real zeros!

Solve by quadratic formulaIf $ax^2 + bx + c = 0$, then

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

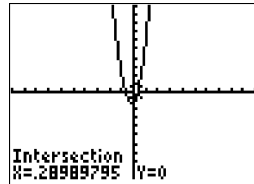
$$5x^2 + 2x - 1 = 0$$

$$x = \frac{-2 \pm \sqrt{24}}{2(5)}$$

$$= \frac{-2 \pm \sqrt{24}}{10}$$

$$x \approx$$

$$x \approx$$



$$2^2 - 4(5)(-1)$$

$$= 4 + 20 = \underline{\underline{24}}$$

(2 sols.)

Homework Assignment
WS 1-5 (1-20 all)