

Unit 7C Day 27: Solving quadratics in intercept form

Focus Question: How do I solve a quadratic in intercept form?

A. Solving from intercept form

1. What are the synonyms for "solve a quadratic?"

Zeros, roots, xint.

2. Find the product of each expression below.

a) $5 \cdot 2 \cdot 0$

0

b) $0 \cdot 592 \cdot 3.64$

0

c) $\frac{4}{11} \cdot 0 \cdot 7\pi$

0

d) $p \cdot q \cdot m \cdot 0$

0

3. Those should have been easy because **if any of the factors is zero**, the product is **0**.

4. Intercept form of a quadratic is $f(x) = a(x-p)(x-q)$. What operation is occurring

between a , $(x-p)$, and $(x-q)$? **Multiply** So, a , $(x-p)$, and $(x-q)$ are all

factors of the quadratic. The other name for intercept form is factored form. Why do both names make sense?

it gives you xint. quickly by showing the factors

5. The first step in solving a quadratic is substitute **0** for **$f(x)$** because

we find the xint when $y=0$

6. So now, we know that we are multiplying to make zero, so ONE of the three **factors** must

equal **0**. Obviously $a \neq 0$ because **there would be no quad.** so one

of the other two factors must equal zero. We don't know which one, so we solve for both and its

okay to have two different answers because **its degree two**.

B. Practice: Solve each of the quadratics below.

1) $f(x) = 4(x-2)(x+7)$

$0 = 4(x-2)(x+7)$

$x-2=0$ or $x+7=0$

$+2 +2$

$x=2$

$-7 -7$

$x=-7$

2) $g(x) = \frac{1}{4}x(x-3)$

$0 = \frac{1}{4}x(x-3)$

$x=0$ or $x-3=0$

$+3 +3$

$x=3$

Don't be fooled into thinking that all you have to do is put the opposite of what's behind the x...you need to show work and do thinking because not all intercepts are integers! $f(x) = a(x-p)(x-q)$ can be deceiving.

$$3) h(x) = (2x-7)(3x+8)$$

$$0 = (2x-7)(3x+8)$$

$$2x-7=0 \text{ or } 3x+8=0$$

$$\begin{array}{r} +7 \ +7 \\ \hline 2x = 7 \\ \hline 2 \ \ 2 \\ \hline x = \frac{7}{2} \end{array}$$

$$\begin{array}{r} -8 \ -8 \\ \hline 3x = -8 \\ \hline 3 \ \ 3 \\ \hline x = -\frac{8}{3} \end{array}$$

$$x = \frac{7}{2}$$

$$x = -\frac{8}{3}$$

$$4) j(x) = 2(x-6)(4x-1)$$

$$0 = 2(x-6)(4x-1)$$

$$x-6=0 \text{ or } 4x-1=0$$

$$\begin{array}{r} +6 \ +6 \\ \hline x = 6 \end{array}$$

$$\begin{array}{r} +1 \ +1 \\ \hline 4x = 1 \\ \hline 4 \ \ 4 \\ \hline x = \frac{1}{4} \end{array}$$

$$x = \frac{1}{4}$$

$$5) h(t) = \frac{1}{4}(t-2)(8t+17)$$

$$0 = \frac{1}{4}(t-2)(8t+17)$$

$$t-2=0$$

$$\begin{array}{r} +2 \ +2 \\ \hline t = 2 \end{array}$$

$$t = 2$$

$$8t+17=0$$

$$\begin{array}{r} -17 \ -17 \\ \hline 8t = -17 \\ \hline 8 \ \ 8 \\ \hline t = -\frac{17}{8} \end{array}$$

$$t = -\frac{17}{8}$$

$$6) P(a) = -5(4a+7)(6a+5)$$

$$0 = -5(4a+7)(6a+5)$$

$$4a+7=0 \text{ or } 6a+5=0$$

$$\begin{array}{r} -7 \ -7 \\ \hline 4a = -7 \\ \hline 4 \ \ 4 \\ \hline a = -\frac{7}{4} \end{array}$$

$$a = -\frac{7}{4}$$

$$\begin{array}{r} -5 \ -5 \\ \hline 6a = -5 \\ \hline 6 \ \ 6 \\ \hline a = -\frac{5}{6} \end{array}$$

$$a = -\frac{5}{6}$$