

Honors Algebra 2

Solve by Factoring Quiz Review

- 1) One side = 0
- 2) Factor (X)
- 3) Set each factor = 0
- 4) Solve each equation

Name Key

Solve each equation by factoring. To get full credit, show the factors. If it is not factorable, write "not factorable". *Many ways to factor, but I will show "guess and check" method*

1) $x^2 + 12x + 32 = 0$

$$\begin{array}{r} \text{a} \\ \text{b} \\ \text{c}^* \\ 1 \quad 12 \quad 32 \\ \hline 1 \quad 32 \\ 2 \quad 16 \\ 4 \quad 8 \end{array}$$

$$\begin{array}{r} (x+4)(x+8) = 0 \\ \begin{array}{r} \diagdown \quad \diagup \\ 4x \quad / \\ + \quad 8x \quad / \\ \hline 12x \quad \ddot{\smile} \end{array} \end{array}$$

2) $n^2 + 2n - 24 = 0$

$$\begin{array}{r} \text{a} \\ \text{b} \\ \text{c} \\ 1 \quad 2 \quad -24 \\ \hline 1 \quad 24 \\ 2 \quad 12 \\ 3 \quad 8 \\ 4 \quad 6 \end{array}$$

$$\begin{array}{r} (n+6)(n-4) = 0 \\ \begin{array}{r} \diagdown \quad \diagup \\ 6n \quad / \\ + \quad -4n \quad / \\ \hline 2n \quad \ddot{\smile} \end{array} \end{array}$$

$$\begin{array}{r} x+4=0 \\ -4 \quad -4 \\ \hline x = -4 \end{array} \quad \begin{array}{r} x+8=0 \\ -8 \quad -8 \\ \hline x = -8 \end{array}$$

$$\begin{array}{r} n+6=0 \\ -6 \quad -6 \\ \hline n = -6 \end{array} \quad \begin{array}{r} n-4=0 \\ +4 \quad +4 \\ \hline n = 4 \end{array}$$

3) $n^2 = 20 - n$

$$\begin{array}{r} \text{a} \\ \text{b} \\ \text{c} \\ 1 \quad 0 \quad -20 \\ \hline 1 \quad 20 \\ 2 \quad 10 \\ 4 \quad 5 \end{array}$$

$$\begin{array}{r} (n+5)(n-4) = 0 \\ \begin{array}{r} \diagdown \quad \diagup \\ 5n \quad / \\ + \quad -4n \quad / \\ \hline 1n \quad \ddot{\smile} \end{array} \end{array}$$

4) $y^2 + 9y = -18$

$$\begin{array}{r} \text{a} \\ \text{b} \\ \text{c} \\ 1 \quad 9 \quad -18 \\ \hline 1 \quad 18 \\ 2 \quad 9 \\ 3 \quad 6 \end{array}$$

$$\begin{array}{r} (y+3)(y+6) = 0 \\ \begin{array}{r} \diagdown \quad \diagup \\ 3y \quad / \\ + \quad 6y \quad / \\ \hline 9y \quad \ddot{\smile} \end{array} \end{array}$$

$$\begin{array}{r} n+5=0 \\ -5 \quad -5 \\ \hline n = -5 \end{array} \quad \begin{array}{r} n-4=0 \\ +4 \quad +4 \\ \hline n = 4 \end{array}$$

$$\begin{array}{r} y+3=0 \\ -3 \quad -3 \\ \hline y = -3 \end{array} \quad \begin{array}{r} y+6=0 \\ -6 \quad -6 \\ \hline y = -6 \end{array}$$

5) $16x^2 - 25 = 0$

$$\begin{array}{r} \text{a} \\ \text{b} \\ \text{c}^* \\ 16 \quad 0 \quad -25 \\ \hline 1 \quad 25 \\ 5 \quad 5 \end{array}$$

$$\begin{array}{r} (4x+5)(4x-5) = 0 \\ \begin{array}{r} \diagdown \quad \diagup \\ 20x \quad / \\ + \quad -20x \quad / \\ \hline 0x \quad \ddot{\smile} \end{array} \end{array}$$

6) $28x^2 + 232x + 64 = 0$

$$\begin{array}{r} \text{a} \\ \text{b} \\ \text{c} \\ 4 \quad 28 \quad 64 \\ \hline 4 \quad 16 \\ 4 \quad 4 \end{array}$$

$$\begin{array}{r} 4(7x+8)(7x+2) = 0 \\ \begin{array}{r} \diagdown \quad \diagup \\ 56x \quad / \\ + \quad 2x \quad / \\ \hline 58x \quad \ddot{\smile} \end{array} \end{array}$$

$$\begin{array}{r} 4x+5=0 \\ -5 \quad -5 \\ \hline 4x = -5 \\ \frac{4x}{4} = \frac{-5}{4} \\ x = -5/4 \end{array} \quad \begin{array}{r} 4x-5=0 \\ +5 \quad +5 \\ \hline 4x = 5 \\ \frac{4x}{4} = \frac{5}{4} \\ x = 5/4 \end{array}$$

$$\begin{array}{r} x+8=0 \\ -8 \quad -8 \\ \hline x = -8 \end{array} \quad \begin{array}{r} 7x+2=0 \\ -2 \quad -2 \\ \hline 7x = -2 \\ \frac{7x}{7} = \frac{-2}{7} \\ x = -2/7 \end{array}$$

- 1) One side = 0
- 2) Factor () ()
- 3) Set each factor = 0
- 4) Solve each equation

7) $9y^2 - 9y - 40 = 0$

a	b+	c*	c
9	-9	-40	40
+	-		1 40
*	-		2 20
			4 10
			5 8

$$(3y-8)(3y+5) = 0$$

$$\begin{array}{r} 3y-8 \\ \times 3y+5 \\ \hline -24y \\ +15y \\ \hline -9y \end{array}$$

$$3y-8=0 \quad 3y+5=0$$

$$\begin{array}{r} 3y-8 \\ +8+8 \\ \hline 3y=8 \\ \frac{3y}{3}=\frac{8}{3} \\ \boxed{y=8/3} \end{array} \quad \begin{array}{r} 3y+5 \\ -5-5 \\ \hline 3y=-5 \\ \frac{3y}{3}=\frac{-5}{3} \\ \boxed{y=-5/3} \end{array}$$

9) $2m^2 + 5m + 3 = 0$

a	b+	c*	c
2	5	3	3
+	+		3
*	+		1 3

$$(2m+3)(m+1) = 0$$

$$\begin{array}{r} 2m+3 \\ \times m+1 \\ \hline 3m \\ +2m \\ \hline 5m \end{array}$$

$$2m+3=0 \quad m+1=0$$

$$\begin{array}{r} 2m+3 \\ -3-3 \\ \hline 2m=-3 \\ \frac{2m}{2}=\frac{-3}{2} \\ \boxed{m=-3/2} \end{array} \quad \begin{array}{r} m+1 \\ -1-1 \\ \hline m=-1 \\ \boxed{m=-1} \end{array}$$

11) $21n^2 - 112n + 70 = 7n$

$$7(2n^2 - 119n + 70) = 0$$

7(3n^2 - 17n + 10) = 0

a	b+	c*	c
3	-17	10	10
+	-		1 10
*	+		2 5

$$7(3n-2)(n-5) = 0$$

$$\begin{array}{r} 3n-2 \\ \times n-5 \\ \hline -2n \\ +15n \\ \hline -17n \end{array}$$

$$3n-2=0 \quad n-5=0$$

$$\begin{array}{r} 3n-2 \\ +2+2 \\ \hline 3n=2 \\ \frac{3n}{3}=\frac{2}{3} \\ \boxed{n=2/3} \end{array} \quad \begin{array}{r} n-5 \\ +5+5 \\ \hline n=5 \\ \boxed{n=5} \end{array}$$

8) $n^2 + 2n + 14 = -4$

a	b+	c*	c
1	2	14	18
+	+		1 18
*	+		2 9
			3 6

$$n^2 + 2n + 18 = 0$$

$$(n+1)(n+18) = 0$$

$$\begin{array}{r} n+1 \\ \times n+18 \\ \hline 18n \\ +n \\ \hline 19n \end{array}$$

(n+2)(n+9) = 0

$$\begin{array}{r} n+2 \\ \times n+9 \\ \hline 9n \\ +2n \\ \hline 11n \end{array}$$

NOT FACTORABLE

10) $35x^2 - 78x = 90 - 3x$

$$5(35x^2 - 75x - 90) = 0$$

a	b+	c*	c
35	-75	-90	18
+	-		1 18
*	-		2 9
			3 6

$$5(7x+6)(x-3) = 0$$

$$\begin{array}{r} 7x+6 \\ \times x-3 \\ \hline -21x \\ +6x \\ \hline -15x \end{array}$$

$$7x+6=0 \quad x-3=0$$

$$\begin{array}{r} 7x+6 \\ -6-6 \\ \hline 7x=-6 \\ \frac{7x}{7}=\frac{-6}{7} \\ \boxed{x=-6/7} \end{array} \quad \begin{array}{r} x-3 \\ +3+3 \\ \hline x=3 \\ \boxed{x=3} \end{array}$$

12) $11x^2 + 3x + 5 = 5 + 4x + 6x^2$

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

a	b+	c*	c
5	-1	0	0
+	-		0 0
*	+		0 1
			0 2

$$(5x-1)(x-0) = 0$$

$$\begin{array}{r} 5x-1 \\ \times x-0 \\ \hline -1x \\ +0x \\ \hline -1x \end{array}$$

5x-1=0 x-0=0

$$\begin{array}{r} 5x-1 \\ +1+1 \\ \hline 5x=1 \\ \frac{5x}{5}=\frac{1}{5} \\ \boxed{x=1/5} \end{array} \quad \begin{array}{r} x-0 \\ +0+0 \\ \hline x=0 \\ \boxed{x=0} \end{array}$$

- OR -

$$x(5x-1) = 0$$

$$\begin{array}{r} 5x-1 \\ +1+1 \\ \hline 5x=1 \\ \frac{5x}{5}=\frac{1}{5} \\ \boxed{x=1/5} \end{array}$$

***Check for solutions on graysonmath.com!!!

