

We are going to keep practicing solving by factoring. Be sure to look for a GCF first in case something has to be taken out.

WARMUP

Factor. Look for a GCF 1st.

<p>1) $10x^2 + 8x$</p>	<p>2) $14x^3 - 28x^2$</p>	<p>3) $4x^2 - 81$</p>																								
<p>4) $2x^2 - 22x + 36$ $\overline{2} \quad \overline{2} \quad \overline{2}$ $2(x^2 - 11x + 18)$ $\begin{matrix} 18 \\ \wedge \\ -2-9 \end{matrix}$ <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr><td style="padding: 2px 5px;">x</td><td style="padding: 2px 5px;">x^2</td><td style="padding: 2px 5px;">$-2x$</td><td style="padding: 2px 5px;">18</td></tr> <tr><td style="padding: 2px 5px;">x</td><td style="padding: 2px 5px;">x^2</td><td style="padding: 2px 5px;">$-2x$</td><td style="padding: 2px 5px;">18</td></tr> <tr><td style="padding: 2px 5px;">-9</td><td style="padding: 2px 5px;">$-2x$</td><td style="padding: 2px 5px;">18</td><td style="padding: 2px 5px;">18</td></tr> </table> $2(x-2)(x-9)$ </p>	x	x^2	$-2x$	18	x	x^2	$-2x$	18	-9	$-2x$	18	18	<p>5) $2x^4 + 22x^3 + 56x^2$ $\overline{2x^2} \quad \overline{2x^2} \quad \overline{2x^2}$ $2x^2(x^2 + 11x + 28)$ $\begin{matrix} 28 \\ \wedge \\ 7-4 \end{matrix}$ <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr><td style="padding: 2px 5px;">x</td><td style="padding: 2px 5px;">x^2</td><td style="padding: 2px 5px;">$7x$</td><td style="padding: 2px 5px;">28</td></tr> <tr><td style="padding: 2px 5px;">x</td><td style="padding: 2px 5px;">x^2</td><td style="padding: 2px 5px;">$7x$</td><td style="padding: 2px 5px;">28</td></tr> <tr><td style="padding: 2px 5px;">4</td><td style="padding: 2px 5px;">$4x$</td><td style="padding: 2px 5px;">28</td><td style="padding: 2px 5px;">28</td></tr> </table> $2x^2(x+7)(x+4)$ </p>	x	x^2	$7x$	28	x	x^2	$7x$	28	4	$4x$	28	28	<p>6) $2x^2 - 2x - 4$ $\overline{2} \quad \overline{2} \quad \overline{2}$ $2(x^2 - x - 2)$ $\begin{matrix} -2 \\ \wedge \\ -2-1 \end{matrix}$ $2(x-2)(x+1)$ </p>
x	x^2	$-2x$	18																							
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4	$4x$	28	28																							

- What is the main difference between **FACTORING** and **SOLVING**?
 GCF then leave () () → set them = 0 & solve

Solve by factoring. Be sure you watch your signs.

<p>7) $3x^3 - 3x = 0$ $\overline{3x} \quad \overline{3x}$ $3x(x^2 - 1) = 0$ $\begin{matrix} x & x & 1 & -1 \\ \wedge & \wedge & \wedge & \wedge \end{matrix}$ $(3x)(x-1)(x+1) = 0$ $3x=0 \quad x-1=0 \quad x+1=0$ $x=0 \quad x=1 \quad x=-1$ </p>	<p>8) $3x^2 = 48$ $\overline{-48} \quad \overline{-48}$ $3x^2 - 48 = 0$ $\frac{3x^2 - 48}{3} = 0$ $3(x^2 - 16) = 0$ $\begin{matrix} x & x & 4 & -4 \\ \wedge & \wedge & \wedge & \wedge \end{matrix}$ $(x-4)(x+4) = 0$ $x-4=0 \quad x+4=0$ $x=4 \quad x=-4$ </p>	<p>9) $12x^2 + 63x = 54$ $\overline{-54} \quad \overline{-54}$ $\frac{12x^2 + 63x - 54}{3} = 0$ $3(4x^2 + 21x - 18) = 0$ $\begin{matrix} -72 \\ \wedge \\ -3 \quad 24 \end{matrix}$ <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr><td style="padding: 2px 5px;">x</td><td style="padding: 2px 5px;">$4x^2$</td><td style="padding: 2px 5px;">$-3x$</td><td style="padding: 2px 5px;">-18</td></tr> <tr><td style="padding: 2px 5px;">x</td><td style="padding: 2px 5px;">$4x^2$</td><td style="padding: 2px 5px;">$-3x$</td><td style="padding: 2px 5px;">-18</td></tr> <tr><td style="padding: 2px 5px;">6</td><td style="padding: 2px 5px;">$24x$</td><td style="padding: 2px 5px;">-18</td><td style="padding: 2px 5px;">-18</td></tr> </table> $(4x-3)(x+6) = 0$ $4x-3=0 \quad x+6=0$ $x = \frac{3}{4} \quad x = -6$ </p>	x	$4x^2$	$-3x$	-18	x	$4x^2$	$-3x$	-18	6	$24x$	-18	-18
x	$4x^2$	$-3x$	-18											
x	$4x^2$	$-3x$	-18											
6	$24x$	-18	-18											

10) $5b^2 + 45b = 0$
 $\frac{5b}{5b} \frac{b+9}{b+9} = 0$
 $(5b)(b+9) = 0$
 $5b = 0 \quad b+9 = 0$
 $b = 0 \quad b = -9$

11) $3x^2 - 10 = 27x$
 $-27x - 27x$
 $3x^2 - 27x - 10 = 0$
 -30
 $3 \quad -10 \quad 6 \quad -5$
 $-3 \quad 10 \quad -6 \quad 5$
 $2 \quad -15$
 $-2 \quad 15$
 $1 \quad -30$
 $-1 \quad 30$
 (Cannot Factor)

12) $\frac{200x^2 - 162}{2} = 0$
 $2(100x^2 - 81) = 0$
 $10x \quad 10x \quad 9 \quad -9$
 $(10x-9)(10x+9) = 0$
 $10x-9=0 \quad 10x+9=0$
 $\frac{10x}{10} = \frac{9}{10} \quad X = \frac{9}{10}$
 $\frac{10x}{10} = -\frac{9}{10} \quad X = -\frac{9}{10}$

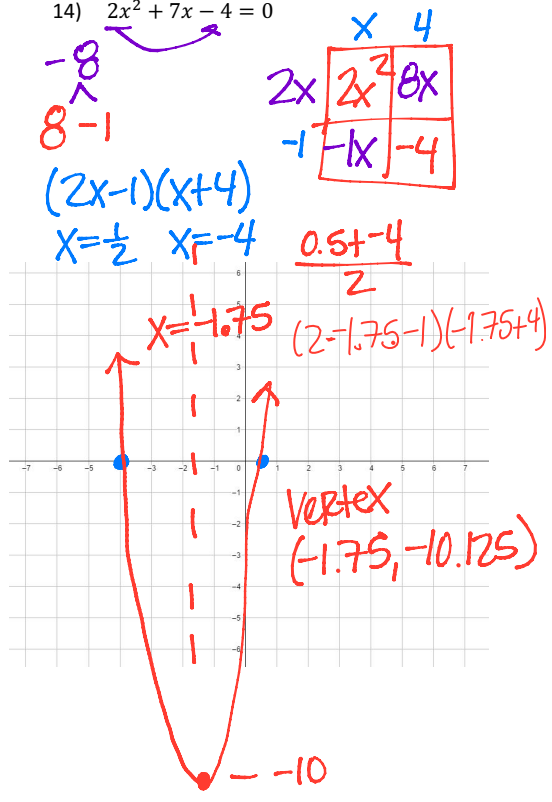
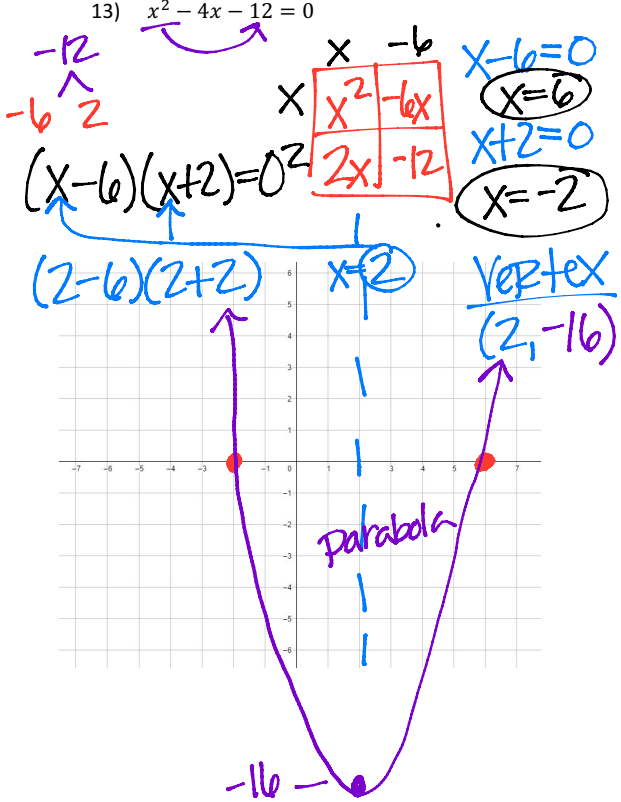
When we solve for x, what do we call them?

- 1) Roots 2) Zeros 3) x-intercepts 4) Solutions

All 4 words mean the same thing!

ROXS

Factor and solve the following. Then sketch a graph.



Factor but find a GCF 1st.

$$\frac{12x^2y^2 + 32xy^3}{4xy^2 \quad 4xy^2}$$

$$4xy^2(3x + 8y)$$

$$\frac{18x^6 + 12x^3}{6x^3 \quad 6x^3}$$

$$6x^3(3x^3 + 2)$$

$$\frac{-x^2 + 5x - 6}{-1 \quad -1 \quad -1}$$

$$-1(x^2 - 5x + 6)$$

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

$$\frac{20y^4 - 15y^3 + 30y^2}{5y^2 \quad 5y^2 \quad 5y^2}$$

$$5y^2(4y^2 - 3y + 6)$$

$$24$$

$$\begin{matrix} \wedge \\ -8 & -3 \\ -4 & -6 \\ -1 & -12 \\ -2 & -12 \end{matrix}$$

$$\frac{17x^2 + 51x}{17x \quad 17x}$$

$$17x(x+3)$$

$$\frac{36x^3 + 63x^2 - 27x}{9x \quad 9x \quad 9x}$$

$$9x(4x^2 + 7x - 3)$$

$$-12$$

$$\begin{matrix} \wedge \\ -6 & 2 \\ -3 & 4 \\ -4 & 3 \\ -2 & 6 \\ -1 & 12 \\ -12 & 1 \end{matrix}$$

Factor the following all the way. Then solve it.

$$4x^2 + 4x - 48 = 0$$

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

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

$$x = -4 \quad x = 3$$