

1.3 Factoring

PRACTICE

Factor completely.		
1. $m^2 + 6m - 27 = (m+9)(m-3)$	2. $h^2 - 25 = (h-5)(h+5)$ $\square - \square$	3. $6p^2 - 72p + 120$ $= 6(p^2 - 12p + 20)$ GCF = 6 $= 6(p-2)(p-10)$
4. $-x^2 + 3x + 40$ $= -1(x^2 - 3x - 40)$ GCF = -1 $= -(x-8)(x+5)$	5. $12k^2 - 54k - 210$ $= 6(2k^2 - 9k - 35)$ GCF = 6 $= 6[2k^2 - 14k + 5k - 35]$ split middle term $= 6[2k(k-7) + 5(k-7)]$ factor by grouping $= 6(k-7)(2k+5)$ <div style="text-align: right; font-size: small;"> mult Add $-20k^2$ $-9k$ $-14k, 5k$ </div>	6. $2n^2 - 7n - 4$ $= (2n^2 - 8n) + (n - 4)$ split middle term $= 2n(n-4) + 1(n-4)$ factor by grouping $= (n-4)(2n+1)$
7. $4r^3 - 28r^2$ $= 4r^2(r-7)$ GCF = $4r^2$	8. $f^2 + 6f + 9$ $= (f+3)^2$ Perfect tri	9. $2t^3 - 5t^2 - 3t$ $= t(2t^2 - 5t - 3)$ GCF = t $= t[2t^2 - 6t + (t - 3)]$ split middle term $= t[2t(t-3) + 1(t-3)]$ factor by grouping $= t(t-3)(2t+1)$
Use factoring to solve.		
10. $x^3 + 6x^2 = 16x$ $x^3 + 6x^2 - 16x = 0$ $x(x^2 + 6x - 16) = 0$ GCF = x $x(x+8)(x-2) = 0$ $x=0 \left\{ \begin{array}{l} x+8=0 \\ x-2=0 \end{array} \right. \left\{ \begin{array}{l} x=-8 \\ x=2 \end{array} \right.$ $x = -8, 0, 2$	11. $r^2 - 7r - 8 = 0$ $(r-8)(r+1) = 0$ $r-8=0 \left\{ \begin{array}{l} r+1=0 \\ r=8 \end{array} \right. \left\{ \begin{array}{l} r=-1 \\ r=-1 \end{array} \right.$ $r = -1, 8$	12. $6t^2 - 13t - 12 = -7$ $6t^2 - 13t - 5 = 0$ $(6t^2 - 15t) + (2t - 5) = 0$ split middle term $3t(2t-5) + 1(2t-5) = 0$ factor by grouping $(2t-5)(3t+1) = 0$ $2t-5=0 \left\{ \begin{array}{l} 3t+1=0 \\ 2t=5 \end{array} \right. \left\{ \begin{array}{l} 3t=-1 \\ 3t=-1 \end{array} \right. \left\{ \begin{array}{l} t=5/2 \\ t=-1/3 \end{array} \right.$ $t = -1/3, 5/2$

Use factoring to solve.

13. $-9v + 2 = v^2 + 20$

$$0 = v^2 + 9v + 18$$

$$0 = (v+3)(v+6)$$

$$0 = v+3 \quad \left. \begin{array}{l} 0 = v+6 \\ -3 = v \end{array} \right\} \begin{array}{l} -6 = v \end{array}$$

$v = -6, -3$

14. $2m^2 + m = 1$

$$2m^2 + m - 1 = 0$$

$$(2m^2 + 2m) + (-m - 1) = 0$$

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

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

$$m+1=0 \quad \left. \begin{array}{l} 2m-1=0 \\ m=-1 \end{array} \right\} \begin{array}{l} 2m=1 \\ m=1/2 \end{array}$$

15. $x^2 + 9x = 0$

$$x(x+9) = 0$$

$$x=0 \quad \left. \begin{array}{l} x+9=0 \\ x=-9 \end{array} \right\}$$

$x = -9, 0$

Graph to solve the following. Round to the nearest thousandth.

16. $x^2 + 6x = 9$

$$x^2 + 6x - 9 = 0$$

$x\text{-int} = -7.243, 1.243$

17. $x^2 - 10x - 140 = 0$

$x\text{-int} = -7.845, 17.845$

18. $-\frac{1}{5}x^2 + 740 = 3x$

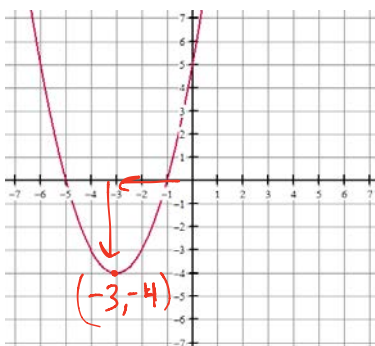
$$-\frac{1}{5}x^2 - 3x + 740 = 0$$

$x\text{-int} = -68.788, 53.788$

Review Skillz

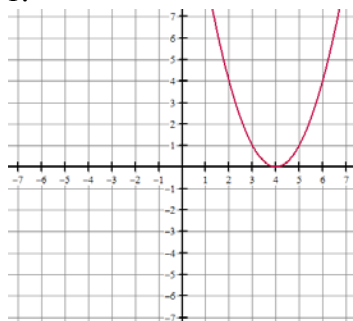
Write the equation of the quadratic function in vertex form, $y = a(x - h)^2 + k$. See example for a refresher!

Example:



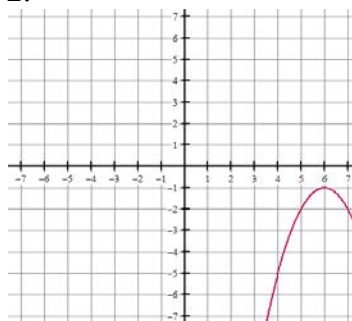
$y = (x + 3)^2 - 4$

1.



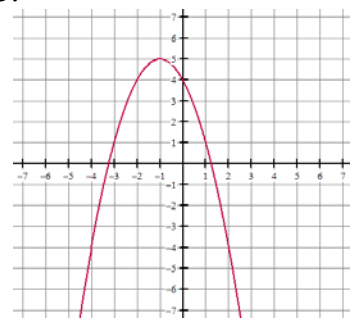
$y = (x - 4)^2$

2.



$y = -(x - 6)^2 - 1$

3.



$y = -(x + 1)^2 + 5$