

Factor completely.

1. $m^2 + 6m - 27$

$$= (m+9)(m-3)$$

2. $h^2 - 25 = (h-5)(h+5)$

3. $6p^2 - 72p + 120$

$$= 6(p^2 - 12p + 20)$$

$$= 6(p-2)(p-10)$$

4. $-x^2 + 3x + 40$

$$= -(x^2 - 3x - 40)$$

$$= -(x-8)(x+5)$$

5. $12k^2 - 54k - 210$

$$= 6(2k^2 - 9k - 35)$$

$$= \frac{6(2k-14)(2k+5)}{2}$$

$$= \frac{6 \cdot 2(k-7)(2k+5)}{2}$$

$$= 6(k-7)(2k+5)$$

$M = -15$

$A = -9$

$N = -14.5$

6. $2n^2 - 7n - 4$

$$= \frac{(2n-8)(2n+1)}{2}$$

$$= \frac{2(n-4)(2n+1)}{2}$$

$$= (n-4)(2n+1)$$

$M = -8$

$A = -7$

$N = -8.1$

7. $4r^3 - 28r^2$

$$= 4r^2(r-7)$$

8. $f^2 + 6f + 9$

$$= (f+3)^2$$

9. $2t^3 - 5t^2 - 3t$

$$= t(2t^2 - 5t - 3)$$

$$= \frac{t(2t-6)(2t+1)}{2}$$

$$= \frac{t \cdot 2(t-3)(2t+1)}{2}$$

$$= t(t-3)(2t+1)$$

$M = -6$

$A = -5$

$N = -6.1$

Use factoring to solve.

10. $x^3 + 6x^2 = 16x$

$$x^3 + 6x^2 - 16x = 0$$

$$x(x^2 + 6x - 16) = 0$$

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

$$x=0 \left\{ \begin{array}{l} x+8=0 \\ x=-8 \end{array} \right. \left\{ \begin{array}{l} x-2=0 \\ x=2 \end{array} \right.$$

11. $r^2 - 7r - 8 = 0$

$$(r-8)(r+1) = 0$$

$$\left. \begin{array}{l} r-8=0 \\ r=8 \end{array} \right\} \left. \begin{array}{l} r+1=0 \\ r=-1 \end{array} \right.$$

12. $6t^2 - 13t - 12 = -7$

$$6t^2 - 13t - 5 = 0$$

$$\frac{(6t-3)(6t-10)}{6} = 0$$

$$\frac{3(2t-1) \cdot 2(3t-5)}{6} = 0$$

$$(2t-1)(3t-5) = 0$$

$$\left. \begin{array}{l} 2t-1=0 \\ 2t=1 \\ t=1/2 \end{array} \right\} \left. \begin{array}{l} 3t-5=0 \\ 3t=5 \\ t=5/3 \end{array} \right.$$

$M = -30$

$A = -13$

$N = -3.1$

Use factoring to solve.

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

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

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

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

$v = -6, -3$

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

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

$$\frac{(2m+2)(m-1)}{2} = 0$$

$$\frac{2(m+1)(m-1)}{2} = 0$$

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

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

$m = -1$

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

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

$$x=0 \quad \left. \begin{array}{l} x+9=6 \\ x=-9 \end{array} \right\}$$

$x = -9, 0$

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

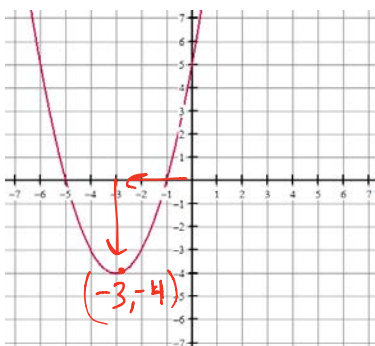
$$-\frac{1}{5}x^2 - 3x + 740 = 0$$

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

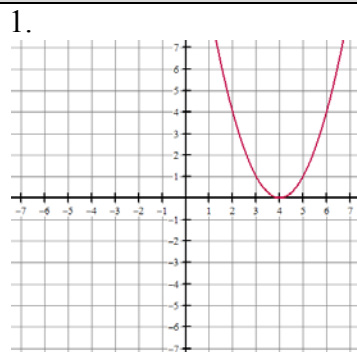
Review Skillz

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

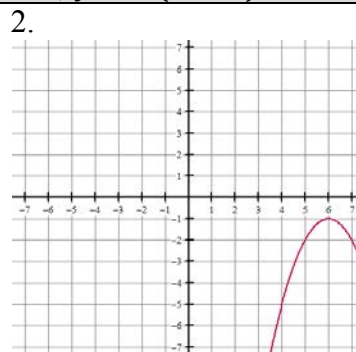
Example:



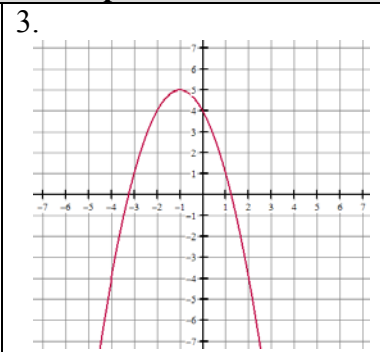
$y = (x + 3)^2 - 4$



$y = (x - 4)^2$



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



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