

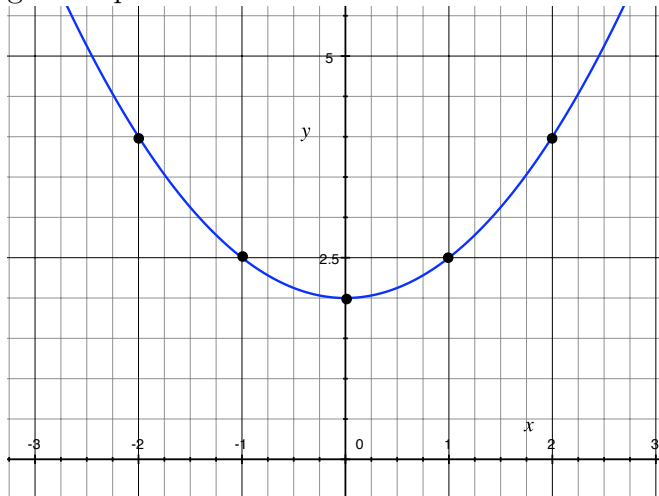
Math 80 Worksheet #4 Solutions

1. Graph the degree 2 polynomial $y = \frac{1}{2}x^2 + 2$. What is the vertex? What is the line of symmetry?

Here are some x -values and the corresponding y -values:

x	-2	-1	0	1	2
y	4	2.5	2	2.5	4

Plotting these points:



2. Perform each indicated operation. Simplify your answer as much as possible.

(a) $(3s^2 + 4s) + (-s^2 + 5s - 3)$

$$(3s^2 + 4s) + (-s^2 + 5s - 3) = (3 - 1)s^2 + (4 + 5)s - 3 = 2s^2 + 9s - 3$$

(b) $(7x^2y - 3xy + xy^2) - (4x^2y - 3xy - xy^2)$

$$\begin{aligned}(7x^2y - 3xy + xy^2) - (4x^2y - 3xy - xy^2) &= (7x^2y - 3xy + xy^2) + (-4x^2y + 3xy + xy^2) \\ &= (7 - 4)x^2y + (-3 + 3)xy + (1 + 1)xy^2 \\ &= 3x^2y + 2xy^2\end{aligned}$$

(c) $(-6a^3) \cdot (2b)$

$$(-6a^3) \cdot (2b) = (-6 \cdot 2)(a^3b) = -12a^3b$$

(d) $3b(2b^2 - \frac{1}{3}b + 4)$

$$3b(2b^2 - \frac{1}{3}b + 4) = 3b(2b^2) + 3b(-\frac{1}{3}b) + 3b(4) = 6b^3 - b^2 + 12b$$

(e) $(6t + 2) \cdot (-2t^3 + 3t^2 - t)$

$$\begin{aligned}(6t + 2) \cdot (-2t^3 + 3t^2 - t) &= 6t(-2t^3 + 3t^2 - t) + 2(-2t^3 + 3t^2 - t) \\ &= -12t^4 + 18t^3 - 6t^2 - 4t^3 + 6t^2 - 2t \\ &= -12t^4 + 14t^3 - 2t\end{aligned}$$

(f) $(2x - 4) \cdot (3x + 1)$

$$\begin{aligned}(2x - 4) \cdot (3x + 1) &= 2x(3x) + 2x(1) - 4(3x) - 4(1) \\ &= 6x^2 + 2x - 12x - 4 \\ &= 6x^2 - 10x - 4\end{aligned}$$

(g) $(10a + 2)^2$

$$\begin{aligned}(10a + 2)^2 &= (10a + 2) \cdot (10a + 2) = (10a)^2 + 2(10a)(2) + 2^2 \\ &= 100a^2 + 40a + 4\end{aligned}$$

(h) $(y - 3)(y + 3)$

$$(y - 3)(y + 3) = y^2 - 3^2 = y^2 - 9$$

(i) $\frac{25x^3 - 15x^2 + 2x}{-5x^2}$

$$\begin{aligned}\frac{25x^3 - 15x^2 + 2x}{-5x^2} &= \frac{25x^3}{-5x^2} + \frac{-15x^2}{-5x^2} + \frac{2x}{-5x^2} \\ &= -5x + 3 - \frac{2}{5x} \text{ (Using the quotient rule.)}\end{aligned}$$

(j) $(4a^2b + 10ab - 6ab^3) \div 2ab^2$

$$\begin{aligned}(4a^2b + 10ab - 6ab^3) \div 2ab^2 &= \frac{4a^2b + 10ab - 6ab^3}{2ab^2} = \frac{4a^2b}{2ab^2} + \frac{10ab}{2ab^2} + \frac{-6ab^3}{2ab^2} \\ &= \frac{2a}{b} + \frac{5}{b} - 3b\end{aligned}$$