Review of Algebra

- Simplifying Fractions
- Order of Operations
- Multiplying Expressions
- Factoring

Pr 1. Compute each of the following and simplify completely.

(a) $\frac{5}{6} \cdot 30$

(b) $-15 \div \frac{1}{6}$

(c) $-\frac{11}{10} + \frac{27}{15}$

(d) $\frac{9}{5} - \left(-\frac{7}{9}\right)$

(e) $\frac{5}{20} \cdot \frac{49}{10} \cdot \frac{20}{5}$

(f) $\frac{3}{5} + \frac{5}{9} + \left(-\frac{3}{5}\right)$

Pr 2. Compute each of the following and simplify completely.

(a) $\dfrac{1}{3^{-4}}$

(b) $\left(\dfrac{5}{3}\right)^{-2}$

(c) $4^5 \cdot 4^3$

(d) $-\sqrt{81}$

(e) $\sqrt{-64}$

(f) $\sqrt[3]{-8}$

Pr 3. Simplify the expression, using the order of operations.

(a) $4(2 + 8 \cdot 4) - 7^2$

(b) $5^2 - 16 \div (9 - 5)$

(c) $(x - y)^2$ when $x = 9, y = 7$

Pr 4. Simplify each of the following.

(a) $3b^2 - 7b + 10 + 2b^2 + 3b - 4$

(b) $(3x)^2 (5x)$

(c) $\left(\frac{1}{3}f^7\right)(18f^3)$

(d) $5q^3(q^2 - q + 5)$

(e) $(q + 3)(q - 6)$

(f) $(x + 5)(x^2 + 3x - 4)$

(g) $(4 - 5y)(4 + 5y)$

(h) $\dfrac{(y + 5)(3 - y)}{(y + 4)(y - 3)}$

Pr 5. Factor each of the following.

(a) $4x^3 - 12x^2 + 16x$

(b) $8x^3 - 8x^2 + 8x - 8$

(c) $m^2 - 11m + 30$

(d) $r^2 - 4r - 12$

(e) $6w^2 - w - 15$

(f) $q^3 - 10q^2 - 24q$

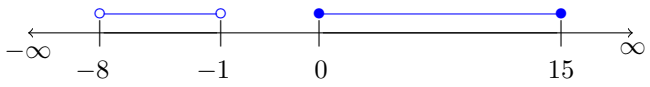
(g) $98r^3 - 72r$

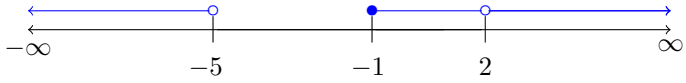
(h) $8p^2 + 2$

Section 5.1 Part a: Writing Interval Notation

- Set-builder notation
- Interval notation
- Segment of the real number line
- Verbal description

Pr 1. Express each of the following using equivalent interval notation and then give a verbal description for each interval.

(a) 

(b) 

(c) $\left\{x | x < \frac{1}{3}\right\}$

(d) $\{x | x \leq -4 \text{ and } x > 10\}$

(e) $\{x | x \neq \pm 4\}$

Pr 2. State the inputs and outputs of each relation.

(a) $R_1 = \{(10, -23),\ (-8, 41),\ (-12, 41),\ (36, 36)\}$

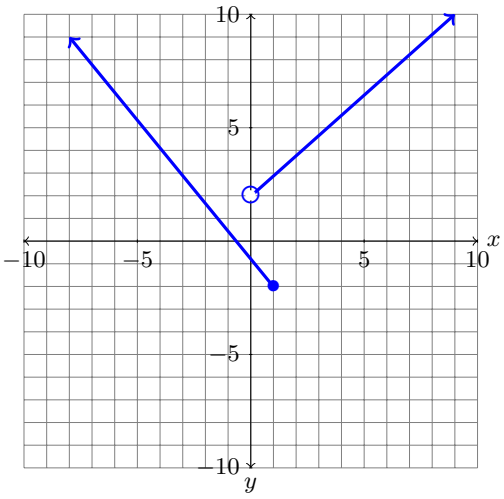
(b) $R_2 = \{(-200, -450),\ (-450, -200),\ (375, -375),\ (-450, 270)\}$

Pr 3. Determine if the given relation is a function. If the relation is a function, state the domain and range of the function.

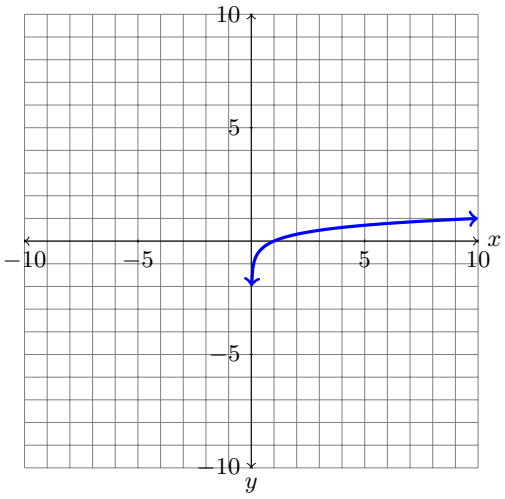
(a) $R_3 = \{(10, -23),\ (-8, 41),\ (-12, 41),\ (36, 36)\}$

(b) $3x + y = 15$

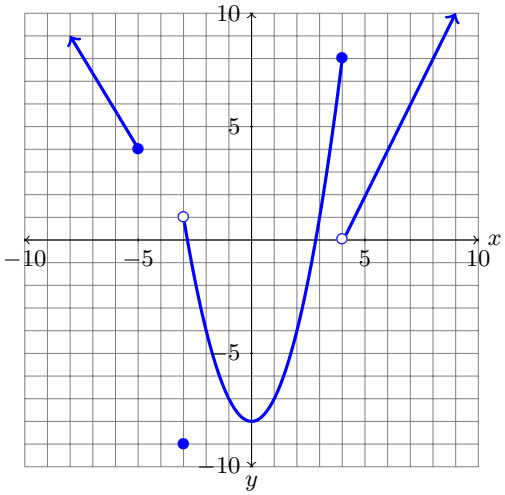
(c)



(d)



Pr 4. Use the graph of $g(x)$ below to answer each of the following.



(a) $g(-4)$

(b) $g(1)$

(c) $g(4)$

(d) $g(-5)$

(e) $g(x) = 1$

(f) $g(x) = -8$

(g) $g(x) = -9$

(h) State the domain of $g(x)$.

(i) State the range of $g(x)$.

Pr 5. Suppose that we let $C(x)$ represent the total cost of making x fidget spinners.

(a) What does $C(100) = 50$ mean, in the context of this problem?

(b) How would we represent the expression 'the total cost for making 25 fidget spinners is \$ 10' using function notation?

Pr 6. Use the function $f(x) = 3 - 2x$ to compute and expand and simplify each of the following.

(a) $f(8)$

(b) $f(3q)$

(c) $f(x - 5)$

(d) $f(x) - f(5)$

Pr 7. Use the function $g(x) = 4x^2 - 3x$ to compute and expand and simplify each of the following.

(a) $g(4)$

(b) $g(x + h)$

(c) $g(x + h) - g(x)$