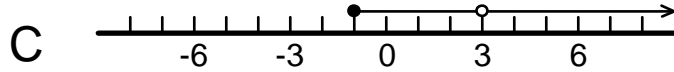
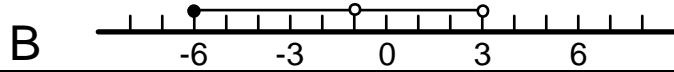
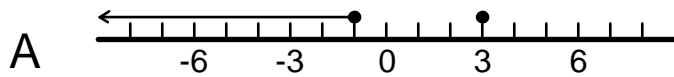
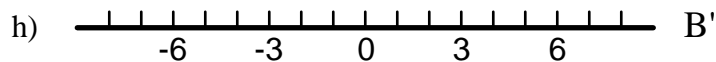
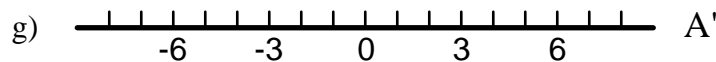
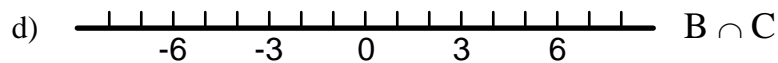
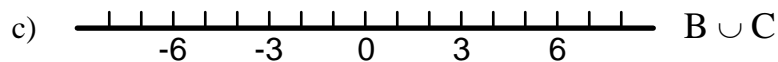
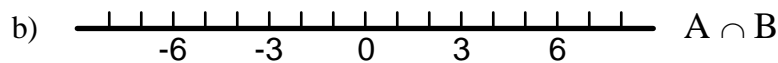
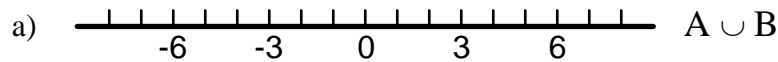


1. Give set-builder notation for each of the following ($x \in \mathbb{R}$):



2. Complete each of the following number lines using the graphs from question #1.



3. If $a = -6$; $b = 2$; $c = \frac{2}{3}$; $d = -\frac{1}{4}$; evaluate each of the following:

a) $2a - 3ab$ b) $(a + b)^2$ c) $\frac{ac}{4bd}$ d) $\frac{a^2 - b^2}{c + d}$

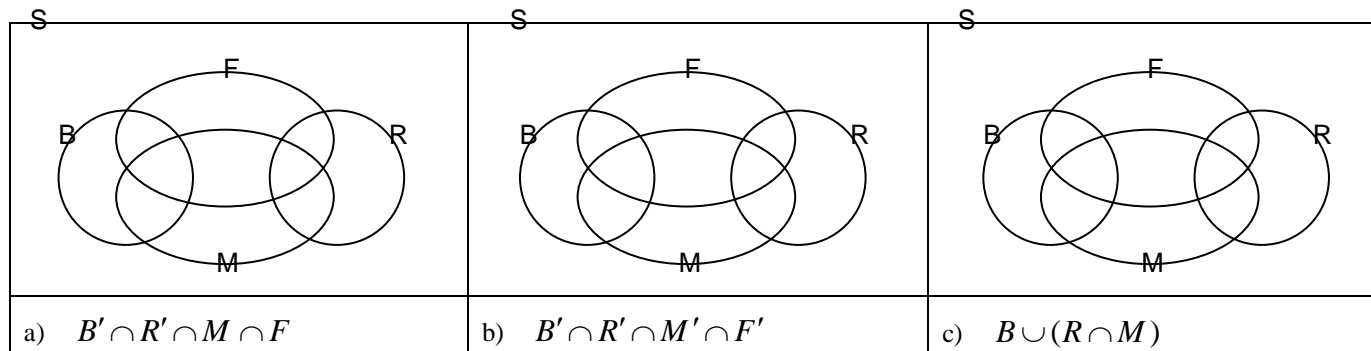
4. Expand and simplify:

a) $5ab - 2a^2b - 3ab^2 + ab^2 - ab + 4a^2b$ b) $3x(x + 7y) - 2y(4x - y)$
 c) $(2x^2 - xy + y^2) - (3xy - 4x^2 - 3y^2)$ d) $(2a + 3b)(a - 4b)$
 e) $8 - 3(4x^2 - x - 2)$ f) $2(x + 3)(x^2 - 2) - (x^2 + 1)(2x + 3)$
 g) $(x^2 + 3x + 2)^2$ h) $(2x^3 - 3xy)^6$

5. Solve each of the following for x : (Answers need **not** be expressed in set-builder notation.)

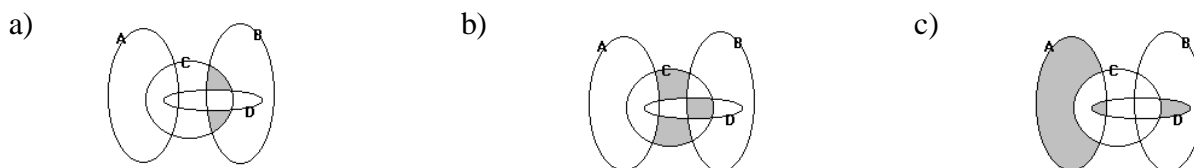
a) $5(x - 2) - 3x = 3 + 5(x + 1)$ b) $2(x - 7) = 3(3x + 7)$
 c) $\frac{3}{4}(3x - 3) = \frac{x}{5}$ d) $\frac{x + 3}{2} - \frac{x - 5}{3} = \frac{2x + 1}{4}$
 e) $3(2x + 1) - 14x \geq 5(3 + x) - 4$ f) $\frac{3}{2x + 1} = \frac{5}{3x + 2}$
 g) $\frac{2x + 3}{4} - \frac{x - 1}{2} > 5 - \frac{2}{3}x$ h) $\frac{1}{x + 2} + \frac{1}{x + 3} = \frac{2}{x + 4}$

6. Express in fraction form: a) 0.432 b) $0.\dot{4}3\dot{2}$ c) $0.43\dot{2}$
7. Express each of the following in decimal form, use repeating decimal notation where appropriate.
 a) $\frac{1}{330} =$ _____ b) $\frac{2357}{11100} =$ _____ c) $\frac{16111}{50000} =$ _____
8. Given the sets representing the standard number families (*Natural Numbers, Whole Numbers, ..., Real Numbers*): $N, W, I, Q, \bar{Q}, \mathcal{R}$ and the following other sets: $\emptyset, Z = \{0\}, M = \{\dots, -4, -3, -2, -1\}$
 For each question below, give one of the sets from the above lists as an answer.
 a) $M \cup W =$ _____ b) $N \cap W =$ _____
 c) $Q \cup \bar{Q} =$ _____ d) $\left\{ \frac{a}{b} \mid b \neq 0, a \in I, b \in I \right\} =$ _____
 e) if $S = I$ then $W' =$ _____ f) if $S = I$ then $W \cap N' =$ _____
9. Assume the universe is the set of all students at RHHS. B is the set of students with black hair, R is the students with red hair, F is the female students, and M is the students presently studying math. In each of the Venn diagrams below, shade in the required regions.



Describe in words, the groups shaded above in diagrams (a) and (c).

10. Give an expression for each shaded region.



Selected Answers:

1. a) $\{x \mid x \leq -1 \text{ or } x = 3, x \in \mathcal{R}\}$ b) $\{x \mid -6 \leq x < 3, x \neq -1, x \in \mathcal{R}\}$ c) $\{x \mid -1 \leq x < 3 \text{ or } x > 3, x \in \mathcal{R}\}$
3. a) 24 b) 16 c) 2 d) $\frac{384}{5}$
4. a) $2a^2b - 2ab^2 + 4ab$ b) $3x^2 + 13xy + 2y^2$ c) $6x^2 - 4xy + 4y^2$ d) $2a^2 - 5ab - 12b^2$
 e) $-12x^2 + 3x + 14$ f) $3x^2 - 6x - 15$ g) $x^4 + 6x^3 + 13x^2 + 12x + 4$
 h) $64x^{18} - 576x^{16}y + 2160x^{14}y^2 - 4320x^{12}y^3 + 4860x^{10}y^4 - 2916x^8y^5 + 729x^6y^6$
5. a) $x = -6$ b) $x = -5$ c) $x = \frac{45}{41}$ d) $x = \frac{35}{4}$ e) $x \leq -\frac{8}{13}$ f) $x = 1$ g) $x > \frac{45}{8}$ h) $x = -\frac{8}{3}$
6. a) $\frac{54}{125}$ b) $\frac{16}{37}$ c) $\frac{389}{900}$ 7. a) 0.003 b) 0.21234 c) 0.32222 8. I, N, \mathcal{R} , Q, M, Z
10. a) $B \cap C \cap D'$ b) $(A' \cap B' \cap C \cap D') \cup (B \cap C \cap D)$ c) $(A \cap C') \cup (A \cap D) \cup (C' \cap D)$