Math 12 – Workshop #3

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1. Consider the sets $A = \{a, b, d\}$ and $B = \{d, a, c\}$
   (a) Find the intersection of A and B, $A \cap B$
   (b) Find the union of A and B, $A \cup B$

2. Suppose that C is the set of all celebrities and D is the set of all people with August birthdays
   (a) Give an example of a person that would be in $C \cap D$
   (b) Give an example of a person that would be in $C \cup D$ that is NOT in $C \cap D$.

3. Given the set $E = \{x \mid x > 1\}$ and $F = \{x \mid x \leq 7\}$
   (a) Find the intersection of E and F, $E \cap F$
   (b) Find the union of E and F, $E \cup F$

4. Find a real number c such that $c \cdot (-2) < c \cdot 1$ is not true.

5. Solve the following inequalities. Write your solution as a graph, and in interval notation.
   (a) $4x - 7 < 2$
   (b) $\frac{3}{2}x > \frac{1}{2} - \frac{1}{3}x$
   (c) $\frac{2}{5} - \frac{1}{3}x > 0$
   (d) $\frac{2}{3}\left(1 - \frac{3}{7}x\right) \leq x$

6. Solve the following inequalities. Write your solution as a graph and in interval notation.
   (a) $-2 < 3x < 9$
   (b) $x < 2$ or $x > 5$
   (c) $x < 2$ and $x > 5$
   (d) $2x + 3 < 9$ or $3x - 2 \geq 10$
   (e) $2x + 3 < 9$ and $3x - 2 \geq 10$
   (f) $4(x - 1) \geq x + 2 \geq 2x - 1$