1. (13 points) Answer the following questions.

   a. (5 points) Is the following inequality true or false? $5\frac{1}{6} \leq 9\frac{2}{3}$

   (TRUE) FALSE

   If false, what is the true inequality?

$$5\tfrac{1}{6} \leq 9\tfrac{2}{3}$$

$$\tfrac{31}{6} \leq \tfrac{29}{3} \cdot \tfrac{2}{2}$$

$$\tfrac{31}{6} \leq \tfrac{58}{6} \quad \checkmark$$

   b. (4 points) Which x is the solution to the equation? $7x + 1 = 10x - 29$

   $x = 2$ $x = 5$ ($x = 10$)

$x=2$ $7(2)+1 = 10(2)-29$

$15 = 20-29$

$15 = -9$ FALSE

$x=5$ $7(5)+1 = 10(5)-29$

$35+1 = 50-29$

$36 = 21$ FALSE

$x=10$ $7(10)+1 = 10(10)-29$

$71 = 100-29$

$71 = 71$ ✓

   c. (4 points) Is the following equation true or false? $-|(-5)\cdot(-2)+(-27)| = -17$

   If false, what is the true equation?

   (TRUE) FALSE

$$-|10+(-27)| \stackrel{?}{=} -17$$

$$-|-17| = -17$$

$$-17 = -17$$

2. (10 points) Simplify each expression.

a. (4 points) $\dfrac{(-5)\cdot(3)-1}{8-4(-2)}$ $= \dfrac{-15-1}{8-(-8)}$

$= \dfrac{-16}{8+8} = \dfrac{-16}{16} = \boxed{-1}$

b. (6 points) $\dfrac{(2^2)(3)+|(-4)+(-2)(3)|}{(6)(3)+(-7)}$

$= \dfrac{(4)(3)+|-4+(-6)|}{18+(-7)}$

$= \dfrac{12+|-10|}{11}$

$= \dfrac{12+10}{11} = \dfrac{22}{11} = \boxed{2}$

3. (15 points) Answer the following problem.

   a. (4 points) Write the word phrase as an algebraic expression.
   The sum of -12 and the quotient of 49 and -7.

$$-12 + \frac{49}{-7}$$

   b. (3 points) Simplify your answer in part (a)

$$-12 + \frac{49}{-7}$$
$$= -12 + -7$$
$$= \boxed{-19}$$

   c. (3points) Does the word phrase represent the following equation?
   If four times a number is added to 7, the result is five less than six times the number.

$$4x + 7 = 6x - 5$$

   (YES) NO

   d. (5 points) Solve the equation from part (c) for x.

$$4x + 7 = 6x - 5$$
$$-4x \quad\quad -4x$$
$$7 = 2x - 5$$
$$12 = 2x$$
$$\boxed{6 = x}$$

4. (15 points) Solve the following equations.

a. (6 points) $3(6x - 7) = 18x - 12$

$18x - 21 = 18x - 12$

$-21 = -12$

FALSE

There is no solution

b. (9 points) $-w + 3(w - 7) = -4(w + 4) + 7$

$-w + 3w - 21 = -4w - 16 + 7$

$2w - 21 = -4w - 9$

$+4w \qquad +4w$

$6w - 21 = -9$

$+21 \qquad +21$

$\frac{6w}{6} = \frac{12}{6}$

$\boxed{w = 2}$

5. (12 points) Solve the proportions.

a. (6 points) $\frac{m}{5} = \frac{m-2}{2}$

$2m = 5(m-2)$

$2m = 5m - 10$

$-3m = -10$

$\boxed{m = \frac{10}{3}}$

b. (6 points) $\frac{6y-4}{y} = \frac{11}{5}$

$5(6y-4) = 11y$

$30y - 20 = 11y$

$-20 = -19y$

$\boxed{\frac{20}{19} = y}$

6. (10 points) On a road map, 6 inches represents 50 miles. How many inches would represent 125 miles?

$$\frac{6}{50} = \frac{x}{125}$$

$$50x = 6(125)$$

$$50x = 750$$

$$x = \frac{750}{50}$$

$$\boxed{x = 15}$$

7. (10 points) Solve the inequality and graph the solution set.

$$-5 \leq (3x - 8) < 6$$

$$-5 \leq 3x - 8 < 6$$

$$+8 \qquad +8 \qquad +8$$

$$\frac{3}{3} \leq \frac{3x}{3} < \frac{14}{3}$$

$$1 \leq x < \frac{14}{3}$$

8. (15 points) Solve the problem.

$$\frac{2}{3}y - \frac{1}{4}y = -\frac{5}{12}y + \frac{1}{2}$$

multiply by 12

$$12 \cdot \frac{2}{3}y - 12 \cdot \frac{1}{4}y = -12 \cdot \frac{5}{12}y + 12 \cdot \frac{1}{2}$$

$$4 \cdot 2 - 3 \cdot y = -5y + 6$$

$$8 - 3y = -5y + 6$$

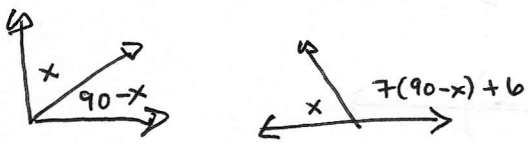
$$2y + 8 = 6$$

$$2y = -2$$

$$\boxed{y = -1}$$

Extra Credit

(10 points) Find the measure of an angle whose supplement measures 6 degrees more than 7 times its complement.



x = angle

$$x + 7(90 - x) + 6 = 180$$

$$x + 630 - 7x + 6 = 180$$

$$-6x = 180 - 636$$

$$-6x = -456$$

$$x = \frac{-456}{-6}$$

$$\boxed{x = 76}$$