Name: ____________________________

Place your answers in the spaces provided. **There is no partial credit on problems 1-3.**
You must show correct work to receive credit.

(8 pts) 1. Perform the indicated operation and simplify.
\[
(4x^3 + 5x - 3) - (3x^3 - 2x^2 + 7x - 4)
\]

(8 pts) 2. Find the x-intercept of the line given by the equation \( y = -\frac{1}{2}x + \frac{3}{5} \).

x- intercept:

(8 pts) 3. Given the functions \( f(x) = 5 - 2x \) and \( g(x) = 2x^2 - 3 \), find \( (f - g)(-3) \).

\[
(f - g)(-3) = \]

(10 pts) 4. Solve the following inequality. Express your answer in terms of intervals.
\[ 4(1 - 2y) \geq 5(y + 3) \]

(8 pts) 5. Find the equation of the line which passes through the point \((6, -7)\) and has slope of \(-\frac{1}{3}\).
Leave your answer in the form \(y = mx + b\).

(10 pts) 6. Given the function \(h(x) = \frac{2x^2 + 1}{x - 4}\), find and simplify the following:

(4 pts) (a) \(h(-2)\)

(6 pts) (b) \(h(3a)\)
(12 pts) 7. Solve the following system of equations. Express your answer as an ordered pair.

\[
\begin{align*}
3a + 4b &= 3 \\
a &= 2b - 4
\end{align*}
\]

(10 pts) 8. Perform the indicated operation and simplify.

(5 pts) (a) \((3x - 2y)^2\)

(5 pts) (b) \((2a + 5b)(a - 3b)\)
(12 pts) 9. A silversmith has two alloys, one containing 35% silver and the other containing 60% silver. How much of each should be melted and combined to obtain 118 grams of an alloy containing 50% silver? (Name the variable(s), set up an equation(s), and solve.)

amount of 35% = 

amount of 60% = 

(14 pts) 10. The value of a machine two years after it was purchased was $15,625. Six years after it was purchased, the value of the machine was $8,125. Assume that the value, \( V \), of the machine is linearly related to time, \( t \), in years since it was purchased.

(a) Find a linear function, \( V(t) \), that fits the data. (Hint: find two points)

\[ V(t) = \]

(b) Use your function from part (a) to find how long after it was purchased the machine was worth $6,250.

how long = 
