(8 pts.) 1. Find the linear function \( f \) that satisfies the given conditions.
\[ f(-3) = 5 \text{ and } f(4) = 2 \]

(8 pts.) 2. Express \( f(x) \) in the form \( a(x - h)^2 + k \)
\[ f(x) = -5x^2 + 10x - 7 \]

(8 pts.) 3. Find the inverse function of \( f(x) = \frac{2}{x - 5} \)

\[ f^{-1}(x) = \]
4. Given that $f(x) = 3x^2 + 7$ and $g(x) = x - 5$, find and simplify each of the following:
   a) $(fg)(2) =$
   b) $(f \circ g)(x) =$

5. On what interval(s) is $f(x) = x^3 - x^2 - 6x$ negative? Give your answer in interval notation.

6. Solve the system. Give your answer(s) as ordered pair(s).
   
   \[
   \begin{align*}
   3x - 4y &= -26 \\
   5x + 6y &= 1
   \end{align*}
   \]
7. Find the domain of $f(x) = \frac{\sqrt{3-x}}{x+5}$. Express your answer in interval notation.

8. Sketch the graph. Label two points on the graph of each piece of the function.

$$f(x) = \begin{cases} 
-3 & \text{if } x \leq -2 \\
 x + 1 & \text{if } -2 < x \leq 2 \\
-2x + 7 & \text{if } x > 2
\end{cases}$$
(12 pts) 9. A movie theater charges $7.00 for adult tickets $4.00 for children tickets. One night, they sold 500 tickets and had receipts totaling $2963.00. How many of each type of ticket was sold? (Name your variable(s), set up an equation(s), and solve)

\[ \text{Number of children tickets} = \]

\[ \text{Number of adult tickets} = \]

(12 pts) 10. A history class determined that the total number of points, \( P \), earned is directly proportional to the number of hours, \( h \), spent studying and inversely proportional to the square of the number of classes, \( c \), skipped.

(4 pts.) a) Assuming \( c \neq 0 \), express \( P \) in terms of \( h \), and \( c \), and a constant of proportionality \( k \).

(4 pts.) b) A student earned 504 points having spent 72 hours studying and skipping 4 classes. Find the value of \( k \) in part (a).

(4 pts.) c) How many points are earned if a student spends 121.5 hours studying and skips 9 classes?