

Name: _____

Place your answers in the spaces provided. You must show correct work to receive credit.

- (8 pts.) 1. Find the linear function f that satisfies the given conditions.

$$f(-3) = 5 \text{ and } f(4) = 2$$

$f(x) =$

- (8 pts.) 2. Express $f(x)$ in the form $a(x - h)^2 + k$

$$f(x) = -5x^2 + 10x - 7$$

$f(x) =$

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

$f^{-1}(x) =$

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(12 pts.) 4. Given that $f(x) = 3x^2 + 7$ and $g(x) = x - 5$, find and simplify each of the following:

(6 pts.) a) $(fg)(2) =$

(6 pts.) b) $(f \circ g)(x) =$

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

(8 pts.) 6. Solve the system. Give your answer(s) as ordered pair(s).

$$\begin{cases} 3x - 4y = -26 \\ 5x + 6y = 1 \end{cases}$$

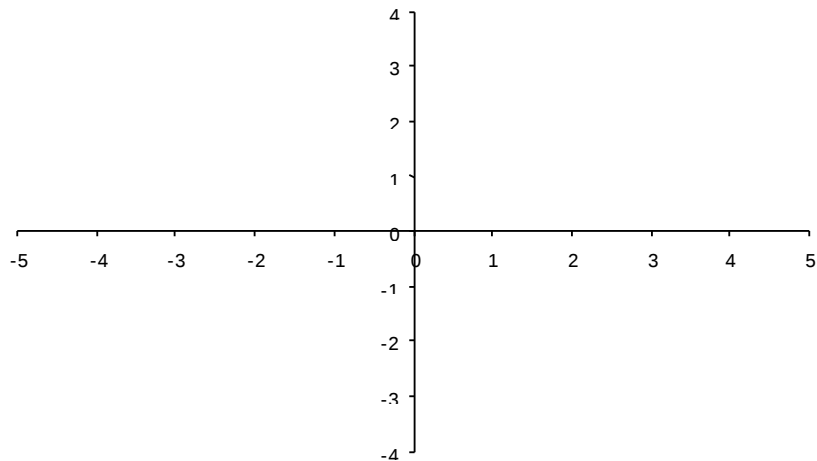
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- (10 pts.) 7. Find the domain of $f(x) = \frac{\sqrt{3-x}}{x+5}$. Express your answer in interval notation.

- (12 pts.) 8. Sketch the graph. Label two points on the graph of each piece of the function.

$$f(x) = \begin{cases} -3 & \text{if } x \leq -2 \\ x+1 & \text{if } -2 < x \leq 2 \\ 2x+7 & \text{if } x > 2 \end{cases}$$



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- (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)

Number of children tickets =

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?