Name: _____

Let f(x) = 3x² - x. Find the following:
(a) f(1)

(b) f(-4)

(c) f(a+1)

2. State the domain and range of the following functions:

(a)
$$f(x) = x^2 + 1$$

(b)
$$f(x) = \sqrt{x+3}$$

(c)
$$f(x) = \frac{9}{x-2}$$

- 3. Use the function given to evaluate the following: $h(x) = \begin{cases} 1 x^5 & : x < 3 \\ e^x & : x = 3 \\ 8 & : x > 3 \end{cases}$
 - (a) h(5)

(b) h(-1)

(c) h(3)

4. Let $f(x) = \sqrt{x^2 - 1}$ and g(x) = x + 1. Find the following: (a) $\left(\frac{g}{f}\right)(x)$

(b) f(g(x))

(c) $(g \circ f)(2)$

5. Find the equation of the line through the point (1, 7) with slope $\frac{2}{3}$. Present your answer in slope-intercept form.

- 6. Find the solutions to the following:
 - (a) 1 (4 (5 x)) = 3x (4 + x)

(b) $x^2 + 5x = -4$

(c) $2\theta \cos(\theta) + \theta = 0$ on $[0, 2\pi]$

7. Given $\sin(\theta) = \frac{12}{13}$ and $\frac{\pi}{2} < \theta < \pi$, find the other 5 trigonometric values.

8. Find the inverse, $f^{-1}(x)$, of the following functions.

(a)
$$f(x) = \frac{4x - 1}{2x + 3}$$

(b) $f(x) = \ln(5x - 1)$

9. Solve the following equations:

(a)
$$4^{2x-3} = 64$$

(b)
$$4e^{2x} - 7e^x = 15$$

(c) $\log_3 x + \log_3(x-6) = 3$

10. Using the properties of logarithms, express the given quantity as a single logarithm: $\ln(a+b) + \ln(a-b) - 2\ln c$

11. Evaluate the following. Keep in mind the restricted function values for inverse trig functions.

(a)
$$\cos^{-1}\left(\frac{\sqrt{2}}{2}\right)$$

(b)
$$\arctan(\sqrt{3})$$

12. Determine if the following functions are even, odd, or neither.

(a)
$$f(x) = 5x^4 - 3x^2 + 7$$

(b)
$$f(x) = 3x - 6$$

(c)
$$f(x) = 4x^5 + 2x^3 - x$$