

Show All Work!!!!!!!!!!!!!!

1. State the **domain** in interval notation.

$$f(x) = \frac{\sqrt{x+4}}{(x-5)(x+6)}$$

2. State the **range** in interval notation.

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

3. For the following function $f(x) = \frac{-3x^2 + 4}{x^2 - 3}$

- State any vertical asymptotes.
- Use limit notation to determine behavior near the vertical asymptote.
- Use limit notation to determine end behavior.
- State any horizontal asymptotes.

4. For the following function $f(x) = x(x-3)(x+2)$

- State whether the function is discontinuous and **why**.
- Describe the functions boundedness.
- State any extrema.
- State the where the function is increasing, decreasing, or constant in interval notation.

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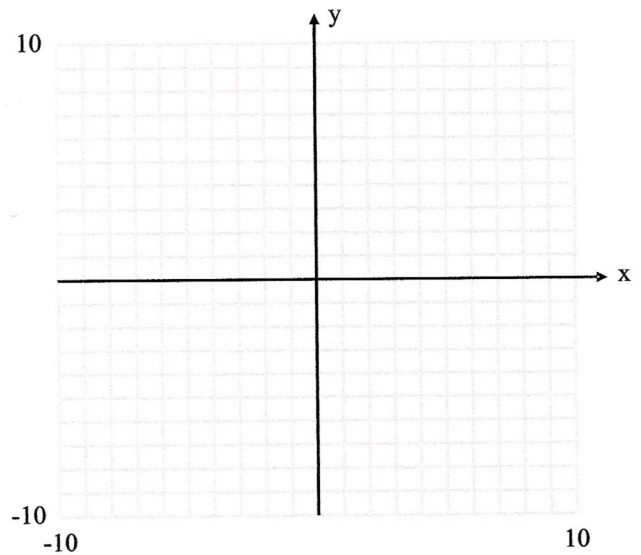
5. Show algebraically whether each function is odd, even, or neither.

$$f(x) = x^3 + 4x - 10$$

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

6. Accurately graph the piecewise-defined function.

$$f(x) = \begin{cases} -\frac{1}{3}x - 2, & \text{if } x < 0 \\ -\sqrt{x} - 2, & \text{if } x \geq 0 \end{cases}$$



7. Find a formula for $f^{-1}(x)$. Give the domain of $f^{-1}(x)$, including any restrictions “inherited” from $f(x)$.

$$f(x) = \sqrt{5x + 6}$$

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8. Show that f and g that $f(g(x)) = x$ and $g(f(x)) = x$, then state what this confirms.

$$f(x) = 2x^3 - 7 \quad \text{and} \quad g(x) = \sqrt[3]{\frac{1}{2}x + 7}$$

9. Given the equation of the function whose graph is $y = x^2$, translated 3 units to the left, stretched reflect over the x -axis, and then vertically by a factor of 2. Finally sketch the graph of the function.

