

# Precalculus

Name: \_\_\_\_\_ Date: \_\_\_\_\_

In exercises 1 – 6 determine if the function is even, odd or neither. Support your answer with algebraic justification.

1.  $f(x) = x^3 - 3x$

**ODD**

2.  $f(x) = 5x^2 + x^4$

**EVEN**

3.  $f(x) = \sqrt{2x^4 + 2}$

**EVEN**

4.  $f(x) = x + \frac{5}{x}$

**ODD**

5.  $f(x) = 0.74x^2 + |x| - 5$

**EVEN**

6.  $f(x) = 8x^4 + 5x + 4$

**NEITHER**

In exercises 7 – 10, find all of the vertical asymptotes of the function.

7.  $f(x) = \frac{x-4}{x^2+8}$

**NO VERTICAL ASYMPTOTES**

8.  $f(x) = \frac{(x-1)(x+5)}{x^2-4}$

**V.A. @  $x = \pm 2$**

9.  $f(x) = \frac{x-5}{(9-x)(8-x)}$

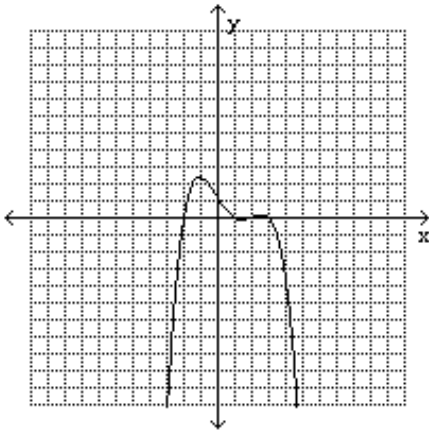
**V.A. @  $x = 9$  AND  $x = 8$**

10.  $f(x) = \frac{x^3-2}{3x+3}$

**V.A. @  $x = -1$**

In exercises 11-15, determine the end behavior of each graph using limit notation.

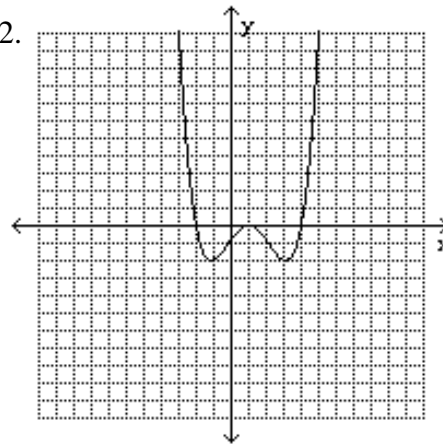
11.



$$x \rightarrow -\infty, f(x) \rightarrow -\infty$$

$$x \rightarrow \infty, f(x) \rightarrow -\infty$$

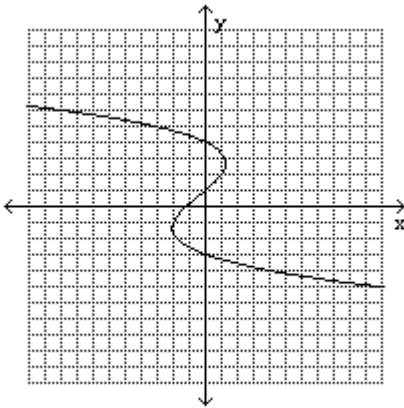
12.



$$x \rightarrow -\infty, f(x) \rightarrow \infty$$

$$x \rightarrow \infty, f(x) \rightarrow \infty$$

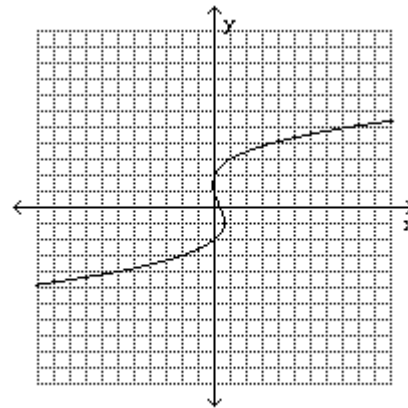
13.



$$x \rightarrow -\infty, f(x) \rightarrow \infty$$

$$x \rightarrow \infty, f(x) \rightarrow -\infty$$

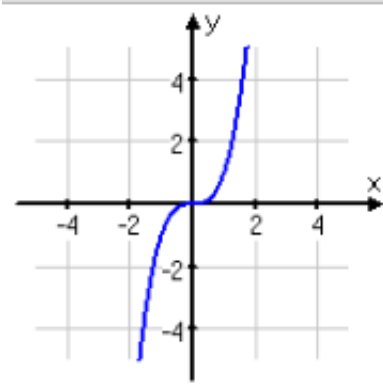
14.



$$x \rightarrow -\infty, f(x) \rightarrow -\infty$$

$$x \rightarrow \infty, f(x) \rightarrow \infty$$

15.



$$x \rightarrow -\infty, f(x) \rightarrow -\infty$$

$$x \rightarrow \infty, f(x) \rightarrow \infty$$