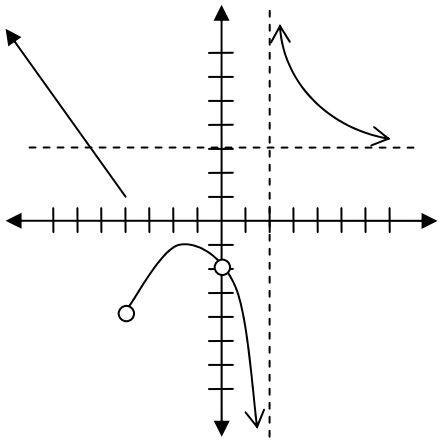
Names: _____

Precalculus BC Rates-of-Growth
Review Group Work

1. Use the graph at right to find each limit. Each tick mark is 1 unit.

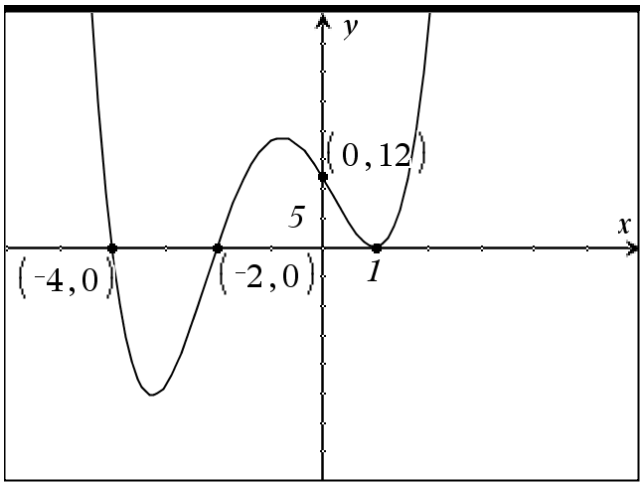


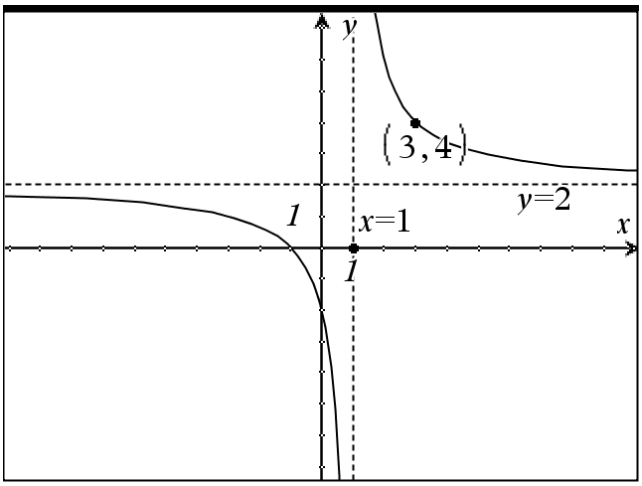
$\lim_{x\to+\infty} f(x)$ = _____ $\lim_{x\to 2^+} f(x)$ = _____

$\lim_{x\to 0} f(x)$ = _____ $\lim_{x\to -4^+} f(x)$ = _____

$\lim_{x\to -4^-} f(x)$ = _____ $\lim_{x\to -\infty} f(x)$ = _____

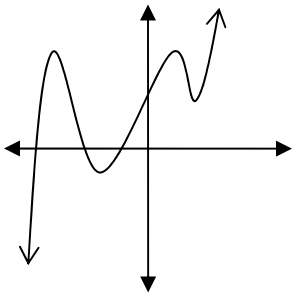
2a & b. Write a formula for each function graphed below:





2c. Now imagine that the function on the right has a hole at $x = -2$. How does your function change?

3. What are the possible degrees for the polynomial graphed at right? Include at least one sentence of explanation in your answer.



4. Find the vertical asymptotes and holes of

$$g(x) = \frac{x^3 - 4x^2 - 3x + 18}{x^2 - 4}$$

5. Find the nonvertical asymptotes of

$$h(x) = \frac{4x^2 + 5x - 2}{2x + 3}$$

6. Make sure you're in radian mode (what's a radian?) and consider the function $f(x) = \frac{\sin x}{x - \pi}$. Estimate $\lim_{x \to \pi} f(x)$. Give supporting values in your answer.

7. Grant's Gadget factory produces x gadgets per month. It has fixed costs of \$25,000 per month and variable costs of \$3.50 – 0.001x per gadget.

a. Write an expression for the total cost of producing x widgets per month.

b. Write an expression for the *average cost per widget*.

c. Find the horizontal asymptotes of the function you found in part (b), and explain their importance in this context.

8. Suppose that $f(x) = \frac{a}{1 - be^{-t}}$. If f has a horizontal asymptote at $y = 4$, and y-intercept 1, find the values of a and b.