

HW L2.8

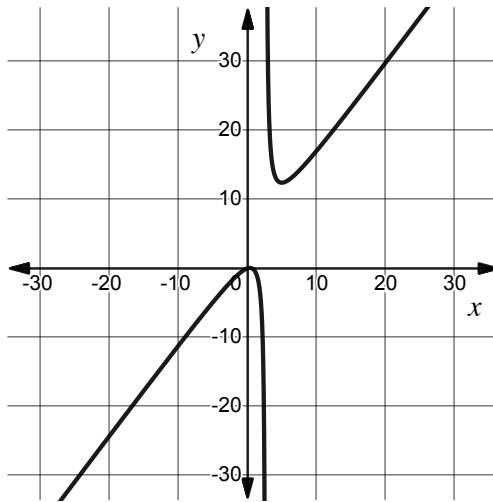
NAME _____


1. What is the remainder when $x^2 - 3x - 28$ is divided by $x - 7$?
2. Find the quotient: $(x^3 - 9x^2 + 5x + 3) \div (x - 1)$
3. Find the quotient: $(3x^3 + 5x^2 - 16x + 2) \div (x + 4)$
4. For a polynomial function p , the value of $p(-4)$ is 11. Which of the following statements is guaranteed to be true?
- A) $x - 4$ is not a factor of $p(x)$.
 - B) $x - 4$ is a factor of $p(x)$.
 - C) $x + 4$ is a factor of $p(x)$.
 - D) None of the above
5. Find the slant asymptote of $g(x) = \frac{x^3 + 2x^2 - 4x + 8}{x^2 - 7x + 1}$.

6. Use division to rewrite the rational function $f(x) = \frac{8x^3 - 24x^2 + 16x + 2}{2x - 5}$ as the sum of a polynomial and a rational function.

7. The graph of a rational function, h , is shown. Which of the following statements is true?

- A) The degree of the numerator of h is less than the degree of the denominator of h .
- B) The degree of the numerator of h is equal to the degree of the denominator of h .
- C) The degree of the numerator of h is exactly one more than the degree of the denominator of h .
- D) The numerator of h is quadratic and the denominator of h is cubic.



 8. The polynomial $g(x) = -2x^3 - x^2 + 6x + 5$ can be written as $-2x^3 - x^2 + 6x + 5 = (x - 4)(m(x)) + k$ where k is a constant and $m(x)$ is a polynomial expression.


a. What is the degree of $m(x)$? How do you know?


b. Find $m(x)$.

c. Find the value of k .

d. Find $g(4)$.

e. What is the remainder when dividing $g(x)$ by $(x - 4)$?

 9. Rewrite $\frac{x^4 + 9x^3 - 4x + 15}{x^2 + 1}$ as the sum of a polynomial expression and a rational expression.

 10. Let $f(x) = (x - a)(x - b)(x - c) + d$ for some constants a, b, c , and d where $d \neq 0$. Decide if each statement is true or false.

a. $x - a$ is a factor of f .

b. $f(c) = d$

c. $\frac{f(x)}{x - c}$ gives a remainder of d .

d. $\frac{f(x)}{x - a} = (x - b)(x - c) + d$