

Alg. 2 4.1- 4.4 Review +Transformation Review

Name _____ Per _____

Describe the end behavior of the graph of the function.

1. $g(x) = 6x^4 - 3x^3 + 12x^2 + 8x + 2$

$$g(x) \rightarrow +\infty \text{ as } x \rightarrow -\infty$$

$$g(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$$

3. $f(x) = -5x - 10 - 3x^4 + 4x^2$

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$$

$$f(x) \rightarrow -\infty \text{ as } x \rightarrow +\infty$$

2. $h(x) = -5x^9 + 6x^7 - 5x^4 + x^2 - 1$

$$h(x) \rightarrow +\infty \text{ as } x \rightarrow -\infty$$

$$h(x) \rightarrow -\infty \text{ as } x \rightarrow +\infty$$

4. $h(x) = -2x + 3x^3 - 4x^2 + 3x^5$

$$h(x) \rightarrow -\infty \text{ as } x \rightarrow -\infty$$

$$h(x) \rightarrow +\infty \text{ as } x \rightarrow +\infty$$

Find the sum or difference.

5. $(10x^4 + 3x^2 - 5x + 4) + (7x^5 - 5x^4 + 2x - 9)$

$$7x^5 + 5x^4 + 3x^2 - 3x - 5$$

6. $(4x^3 + 6x^2 - 9x + 1) - (8x^3 + 2x^2 - 5x - 1)$

$$-4x^3 + 4x^2 - 4x + 2$$

Find the product.

7. $5x^2(3x^2 + 7x + 6)$

$$15x^4 + 35x^3 + 30x^2$$

8. $(8x^2 - 3x + 1)(-3x + 2)$

$$-24x^3 + 25x^2 - 9x + 2$$

Divide using polynomial long division.

9. $(4x^4 + 2x^3 - 9x^2 - 36) \div (x^2 + x - 4)$

$$4x^2 - 2x + 9 - \frac{17x}{x^2 + x - 4}$$

10. $(2x^4 - 40x^2 - 28) \div (x^2 - 5x - 2)$

$$2x^2 + 10x + 14 + \frac{90x}{x^2 - 5x - 2}$$

Divide using synthetic division.

11. $(4x^2 - 15x + 7) \div (x - 2)$

$$4x - 7 - \frac{7}{x - 2}$$

12. $(x^3 - 9x + 12) \div (x + 3)$

$$x^2 - 3x + \frac{12}{x + 3}$$

Use synthetic division to evaluate the function for the indicated value of x .

13. $f(x) = x^3 + x^2 - 4x + 3; x = -1$

$$f(-1) = 7$$

14. $f(x) = -x^3 - 6x^2 + 6; x = -2$

$$f(-2) = -10$$

Factor the polynomial completely.

15. $x^3 - x^2 - 12x$

$$x(x-4)(x+3)$$

16. $9p^7 - 36p^5$

$$9p^5(p-2)(p+2)$$

17. $x^3 + 27$

$$(x+3)(x^2 - 3x + 9)$$

18. $w^3 - 125$

$$(w-5)(w^2 + 5w + 25)$$

19. $x^3 - 7x^2 + 5x - 35$

$$(x^2 + 5)(x-7)$$

20. $m^3 - 2m^2 - 16m + 32$

$$(m-2)(m+4)(m-4)$$

Write a rule for g described by the transformations of the graph of f .

21. $f(x) = x^2$; translation 2 units right

$$g(x) = x^2 - 4x + 4$$

22. $f(x) = 4x^2 + 5$; translation 6 units left

$$g(x) = 4x^2 + 48x + 149$$

23. $f(x) = -2|x| - 1$; translation 7 units left

$$g(x) = -2|x+7| - 1$$

24. $f(x) = -2x + 4$; translation 3 units right

$$g(x) = -2x + 10$$

25. $f(x) = 3x + 11$; translation 4 units right

$$g(x) = 3x - 1$$

26. $f(x) = -5x - 16$; translation 1 unit left

$$g(x) = -5x - 21$$

27. $f(x) = 4x^2 + 5$; horizontal stretch by a factor of 2 and a translation 2 units up.

$$g(x) = x^2 + 7$$

28. $f(x) = x^2$; vertical stretch by a factor of 3 and a reflection in the x -axis, followed by a translation 3 units down

$$g(x) = -3x^2 - 3$$