Name_____ Functions ch 2.1-2.4 REVIEW

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

If the following is a polynomial function, then state its degree and leading coefficient. If it is not, then state this fact.

1) $f(x) = -20x^4 - 5x - 4$

2) $f(x) = -13x^9 - 4x + 8$

Write an equation for the linear function f satisfying the given conditions.

3) $f(-1) = -5$ and $f(5) = 7$

4) $f(-1) = -5$ and $f(5) = 7$

Find the vertex of the graph of the function.

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

6) $f(x) = -2x^2 - 16x - 34$

7) $f(x) = 2x^2 - 12x + 14$

Find the axis of the graph of the function.

8) $f(x) = 3x^2 + 30x + 78$

Write the quadratic function in vertex form.

9) $y = x^2 + 16x + 54$

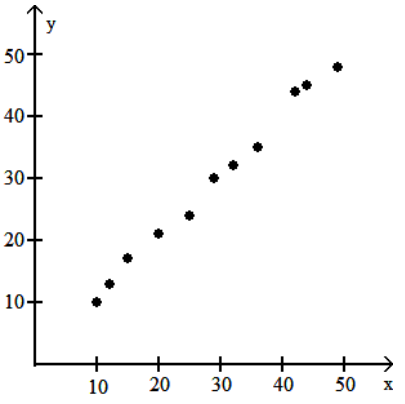
Write an equation for the quadratic function whose graph contains the given vertex and point.

10) Vertex (5, 5), point (7, 13)

11) Vertex (5, 1), point (0, 76)

Describe the strength and direction of the linear correlation.

12)



Determine if the function is a power function. If it is, then state the power and constant of variation.

13) $f(x) = \frac{1}{2}x^4$

14) $f(x) = \frac{1}{4}x^5$

Sketch the general shape of the graph for $x \geq 0$. (either quadrant I or IV)

15) $f(x) = -\frac{2}{7}x^4$

16) $f(x) = \frac{3}{5}x^{-5}$

17) $f(x) = 3x^{1/4}$

Determine whether the power function is even, odd, or neither.

18) $f(x) = 10x^{1/4}$

19) $f(x) = 9x^{1/5}$

20) $f(x) = -4x^{2/5}$

21) $f(x) = -11x^{4/5}$

Describe the end behavior of the polynomial function by finding $\lim_{x\to\infty} f(x)$ and $\lim_{x\to-\infty} f(x)$.

22) $f(x) = -7x^4 - 5x^2 + 5$

23) $f(x) = x^3 + 7x^2 + 2x - 6$

24) $f(x) = x^3 - 5x^2 + 4x - 9$

Find the zeros of the function.

25) $f(x) = x^2 - 7x + 12$

26) $f(x) = x^3 - 36x$

Find the zeros of the polynomial function and state the multiplicity of each.

27) $f(x) = (x + 4)^2(x - 1)$

Graph the function.

28) $P(x) = 2x(x + 2)(x + 1)$

Find a cubic function with the given zeros.

29) $-6, 5, -2$

Divide f(x) by d(x), and write a summary statement in the form indicated.

30) $f(x) = x^4 + 4x^3 - 2x^2 + 4x - 3; d(x) = x^2 + 1$
(Write answer in fractional form)

Divide using synthetic division, and write a summary statement in fraction form.

31) $\dfrac{2x^3 + 3x^2 + 4x - 10}{x + 1}$

Find the remainder when f(x) is divided by (x - k)

32) $f(x) = x^2 + 4x + 9; k = -5$

Use the Factor Theorem to determine whether the first polynomial is a factor of the second polynomial.

33) $x + 3; 5x^4 + 16x^3 - 3x^2 + x + 4$

Use the Rational Zeros Theorem to write a list of all potential rational zeros

34) $f(x) = 7x^3 + 11x^2 + 2x - 14$

Find all rational zeros.

35) $f(x) = x^3 - 6x^2 + 5x + 12$

36) $f(x) = x^3 - 8x^2 + 11x + 20$

Find all of the real zeros of the function. Give exact values whenever possible. Identify each zero as rational or irrational.

37) $f(x) = x^3 + 5x^2 - 6x - 30$

38) $f(x) = x^3 + 2x^2 - 13x - 26$