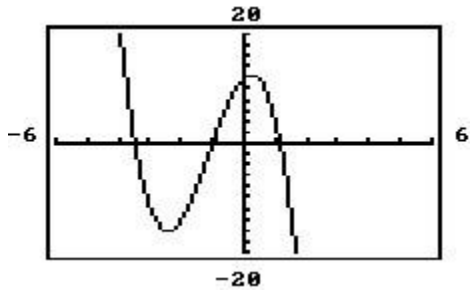
Name_____ 2.3/2.4 REVIEW

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Match the given graph with its polynomial function.

1)



A) $f(x) = -3x^5 + 2x^4 - x^2 + 2x - 12$

B) $f(x) = -3x^3 - 10x^2 + 5x + 12$

C) $f(x) = x^4 - 2x^2 - 3x + 12$

D) $f(x) = 2x^3 - 12x^2 - 5x - 12$

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

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

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

3) $f(x) = -3x^4 - 5x^2 - 7$

Find the zeros of the function.

4) $f(x) = x^3 - 16x$

5) $f(x) = 3x^3 + 4x^2 + 1x$

6) $f(x) = x^2 + 9x + 20$

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

7) $f(x) = x^3 + 2x^2 + 5x - 7$

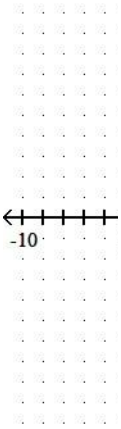
Find the zeros of the polynomial function and state the multiplicity of each.

8) $f(x) = -5x^2(x - 8)(x + 3)^3$

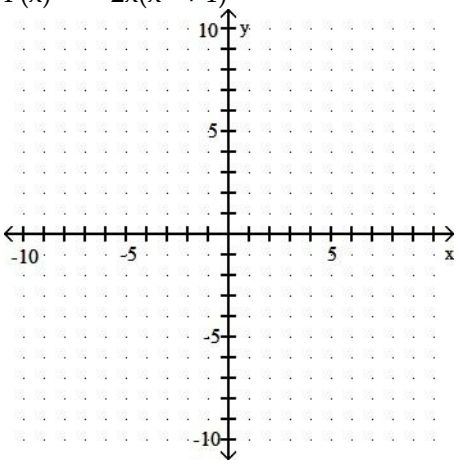
9) $f(x) = 5(x + 7)^2(x - 7)^3$

Graph the function.

10) $P(x) = 3x(x + 2)(x - 1)$



11) $P(x) = -2x(x + 1)^2$



Find a cubic function with the given zeros.

12) 6, −4, 7

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

13) $f(x) = 4x^3 - 14x^2 - 6x + 5$; $d(x) = 2x + 1$ (Write answer in polynomial form)

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

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

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

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

16) $f(x) = 2x^3 + 2x^2 + 3x + 4$; $k = -2$

17) $f(x) = x^5 + 4x^4 - 5x^3 + 2x^2 - 4x - 7$; $k = 3$

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

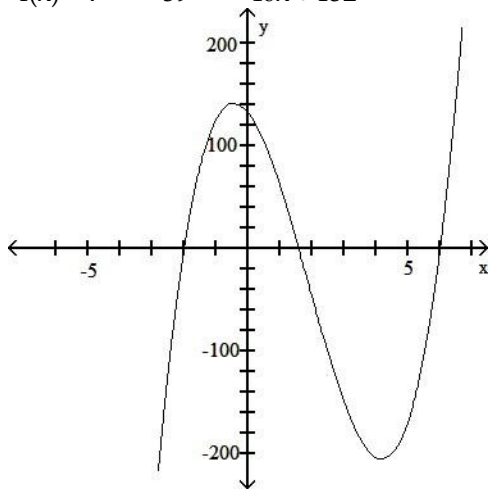
18) $x - 2$; $5x^2 - 24x + 28$

19) $x + 2$; $6x^3 + 9x^2 - 5x + 2$

20) $x + 4$; $8x^4 + 33x^3 - 4x^2 + x + 4$

Use the graph to guess possible linear factors of f(x). Then completely factor f(x) with the aid of synthetic division.

21) $f(x) = 7^{x^3} - 39^{x^2} - 40x + 132$



Find the requested function.

22) Find the polynomial function with leading coefficient -7; degree 3; and -4, 4, and 2 as zeros.

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

23) $f(x) = 3x^3 + 37x^2 + 37x + 27$

24) $f(x) = 2x^3 + 5x^2 + 12x - 8$

Find all rational zeros.

25) $f(x) = {}^{x^3} + 4^{x^2} - 27x - 90$

26) $f(x) = 10^{x^3} + 53^{x^2} + 14x - 5$

1) B

2) $\infty, -\infty$

3) $-\infty, -\infty$

4) 0, 4, and -4

5) 0, $-\frac{1}{3}$, and -1

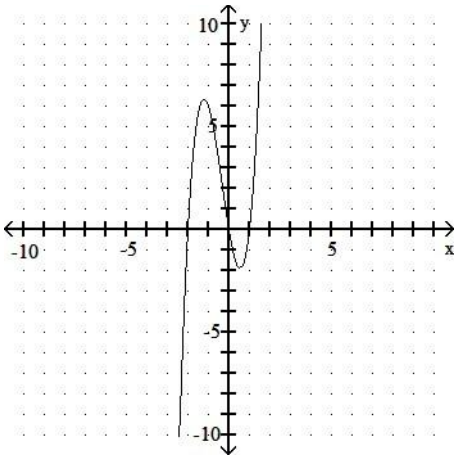
6) -4 and -5

7) $\infty, -\infty$

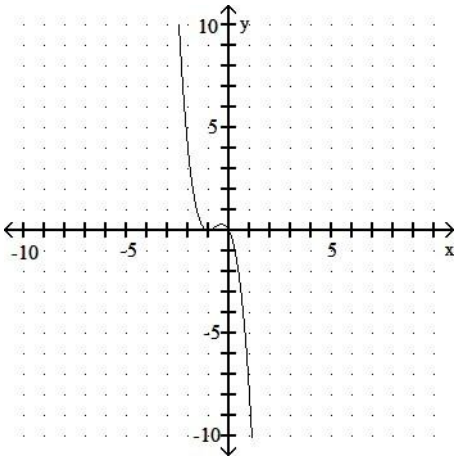
8) -3, multiplicity 3; 0, multiplicity 2; 8, multiplicity 1

9) -7, multiplicity 2; 7, multiplicity 3

10)



11)



12) $f(x) = x^3 - 9x^2 - 10x + 168$

13) $f(x) = (2x + 1)(2x^2 - 8x + 1) + 4$

14) $\frac{f(x)}{(x^2+1)} = (x^2 - 4x - 3)$

15) $2^{x^2 + x + 3 + \frac{-13}{x+1}}$

16) −10

17) 431

18) Yes

19) Yes

20) No

21) $f(x) = (x + 2)(x - 6)(7x - 11)$

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

23) ±1, ±1/3, ±3, ±9, ±27

24) ±1, ±1/2, ±2, ±4, ±8

25) −3, −6, 5

26) $-\frac{1}{2}, \frac{1}{5}, -5$