Practice 17

Definition of Polynomials and Sketching their Graphs

Determine whether the function is a polynomial function.

1) $f(x) = 4x + 3x^3$ 1) _____

A) Yes B) No

2) $f(x) = \frac{5 - x^4}{9}$ 2) _____

A) No B) Yes

3) $f(x) = -11x^3 - 6x + \frac{3}{x}$ 3) _____

A) No B) Yes

Find the degree of the polynomial function.

4) $f(x) = -2x + 6x^4$ 4) _____

A) 6 B) -2 C) 1 D) 4

5) $f(x) = \frac{5 - x^2}{9}$ 5) _____

A) $-\frac{1}{9}$ B) 0 C) 5 D) 2

6) $f(x) = 5x - x^4 + \frac{5}{4}$ 6) _____

A) 5 B) 4 C) -1 D) 1

7) $h(x) = 17x - 8$ 7) _____

A) 2 B) 17 C) 0 D) 1

Find the zeros for the polynomial function and give the multiplicity for each zero. State whether the graph crosses the x-axis or touches the x-axis and turns around, at each zero.

8) $f(x) = 4(x - 3)(x + 6)^4$ 8) _____

A) -3, multiplicity 1, touches x-axis and turns around; 6, multiplicity 4, crosses x-axis

B) 3, multiplicity 1, crosses x-axis; -6, multiplicity 4, touches x-axis and turns around

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

A) - 4, multiplicity 1, touches the x-axis and turns around; 3, multiplicity 3, touches x-axis and turns around

B) - 4, multiplicity 1, crosses x-axis; 3, multiplicity 3, crosses x-axis

Find the x-intercepts of the polynomial function. State whether the graph crosses the x-axis, or touches the x-axis and turns around, at each intercept.

10) $f(x) = 6x^2 - x^3$ 10) _____

A) 0, touches the x-axis and turns around;
6, crosses the x-axis

B) 0, touches the x-axis and turns around;
$\sqrt{6}$, crosses the x-axis;
$-\sqrt{6}$, crosses the x-axis

11) $f(x) = x^4 - 121x^2$ 11) _____

A) 0, touches the x-axis and turns around;
11, crosses the x-axis;
-11, crosses the x-axis

B) 0, touches the x-axis and turns around;
121, crosses the x-axis

12) $f(x) = -x^2(x + 8)(x^2 - 1)$ 12) _____

A) 0, touches the x-axis and turns around;
-8, crosses the x-axis;
-1, crosses the x-axis;
1, crosses the x-axis

B) 0, touches the x-axis and turns around;
8, crosses the x-axis;
-1, touches the x-axis and turns around;
1, touches the x-axis and turns around

Find the y-intercept of the polynomial function.

13) $f(x) = 4x - x^3$ 13) _____

A) -1 B) 0 C) -4 D) 4

14) $f(x) = -x^2 + 2x + 8$ 14) _____

A) -1 B) 0 C) 8 D) -8

Determine whether the graph of the polynomial has y-axis symmetry, origin symmetry, or neither.

15) $f(x) = 7x^2 - x^3$ 15) _____

A) y-axis symmetry B) origin symmetry C) neither

16) $f(x) = 5 - x^4$ 16) _____

A) origin symmetry B) y-axis symmetry C) neither

17) $f(x) = x^4 - 9x^2$ 17) _____

A) y-axis symmetry B) origin symmetry C) neither

18) $f(x) = x^3 - 2x$ 18) _____

A) y-axis symmetry B) origin symmetry C) neither

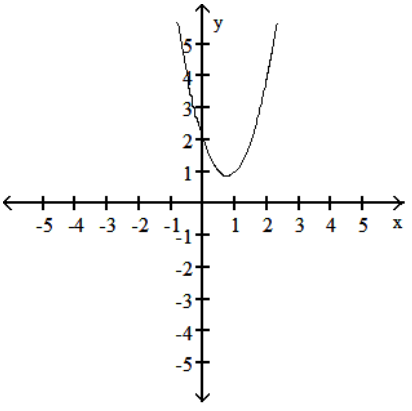
Use the Leading Coefficient Test to determine the end behavior of the polynomial function. Then use this end behavior to match the function with its graph.

19) $f(x) = 2x^2 - 3x + 2$ 19) _____

20) $f(x) = 4x^3 - 2x^2 - 2x - 1$ 20) _____

Answer Key
Testname: 17_ DEFINITION OF POLYNOMIALS AND SKETCHING THEIR GRAPHS

1) A
2) B
3) A
4) D
5) D
6) B
7) D
8) B
9) B
10) A
11) A
12) A
13) B
14) C
15) C
16) B
17) A
18) B
19) rises to the left and rises to the right



20) falls to the left and rises to the right