

Print Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Write your answer in the blank provided. If a question appears to not have instructions, the instructions for the previous question apply. A specific method of solving an equation may be given but you can use any method you choose. Good luck and have fun!

Simplify. Write your answer in the form $a + bi$, where a and b are real numbers.

1) $(-4 - 7i) + (9 + 4i)$

1) _____

A) $9 + 3i$

B) $5 + 3i$

C) $9 - 3i$

D) $5 - 3i$

Simplify.

2) i^{32}

2) _____

A) i

B) $-i$

C) -1

D) 1

Simplify. Write your answers in the form of $a+bi$, where a and b are real numbers.

3) $\frac{i}{5+i}$

3) _____

A) $\frac{1}{26} + \frac{5}{26}i$

B) $\frac{1}{26} - \frac{5}{26}i$

C) $\frac{1}{26}$

D) $\frac{5}{26}i$

4) $(3 + 3i)(3 - 3i)$
A) 0

B) 18

C) $9 - 9i$

D) $9 + 9i$

4) _____

Solve.

5) $49t^3 + 16t = -70t^2$

A) $-\frac{8}{49}, \frac{24}{49}$

B) $-\frac{2}{7}, -\frac{8}{7}$

C) $0, -\frac{2}{7}, -\frac{8}{7}$

D) $0, \frac{2}{7}, \frac{8}{7}$

5) _____

6) $(4x - 7)(4x - 3) = 0$

A) $-\frac{7}{4}, -\frac{3}{4}$

B) $\frac{7}{16}, \frac{7}{16}$

C) $\frac{7}{4}, \frac{3}{4}$

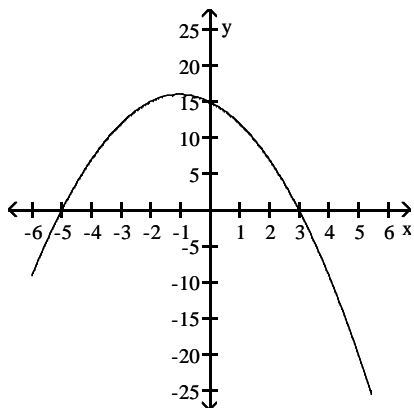
D) $\frac{3}{8}, \frac{9}{8}$

6) _____

Use the given graph to find the x -intercepts and zeros of the function. [The answers are given with x -intercepts in ordered pair notation first and then the zeros of the function written in a list.]

7)

7) _____



A) $(-3, 0), (5, 0); -3, 5$

B) $(-5, 0), (-3, 0); -5, -3$

C) $(3, 0), (5, 0); 3, 5$

D) $(-5, 0), (3, 0); -5, 3$

Solve.

8) $7x^2 = 21x$

8) _____

A) 0, 3

B) 3

C) 7, 3

D) 10.5

Find the range of the given function.

9) $f(x) = \frac{1}{2}x^2 - 8x - \frac{5}{2}$

9) _____

A) $\left[-\frac{69}{2}, \infty\right)$

B) $(-\infty, 0]$

C) $\left[\frac{187}{2}, \infty\right)$

D) $\left(-\infty, -\frac{53}{2}\right]$

Determine whether there is a maximum or minimum value for the given function, and find that value.

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

10) _____

A) Minimum: -10

B) Maximum: -10

C) Maximum: 10

D) Minimum: 0

11) $f(x) = -5x^2 - 10x - 15$

11) _____

A) Maximum: -10

B) Maximum: 10

C) Minimum: 10

D) Minimum: 0

Solve.

12) A rock falls from a tower that is 160 ft high. As it is falling, its height is given by the function $h(t) = 160 - 16t^2$. How many seconds will it take for the rock to hit the ground ($h=0$)? 12) _____

A) 1600 sec

B) 3.2 sec

C) 12.6 sec

D) 10.2 sec

13) $\frac{8}{y+5} - \frac{2}{y-5} = \frac{10}{y^2-25}$ 13) _____

A) $\sqrt{31}$

B) 60

C) 10

D) -10

14) $\sqrt[5]{6x+7} = 3$ 14) _____

A) $\frac{81}{2}$

B) 243

C) $\frac{118}{3}$

D) 236

15) $\sqrt{y-7} + 4 = 0$
A) 23

15) _____

B) -4, 4

C) No solution

D) -2, 2

16) $\sqrt{x} - \sqrt{8x-8} = 1$
A) $-\frac{17}{49}$

16) _____

B) $\frac{17}{49}$

C) 1

D) $\frac{81}{49}$

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

17) $f(x) = (x^2 + 12x + 27)^2$

17) _____

A) 9, multiplicity 2; 3, multiplicity 2

B) $-\sqrt{3}$, multiplicity 4

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

D) $\sqrt{3}$, multiplicity 2; $-\sqrt{3}$, multiplicity 2

Classify the polynomial as constant, linear, quadratic, cubic, or quartic, and determine the leading term, the leading coefficient, and the degree of the polynomial.

18) $g(x) = 339x^2 + 4237x^3$

18) _____

A) Cubic; x^3 ; 4237; 3

B) Cubic; $4237x^3$; 4237; 3

C) Quadratic; $4237x^2$; 4237; 2

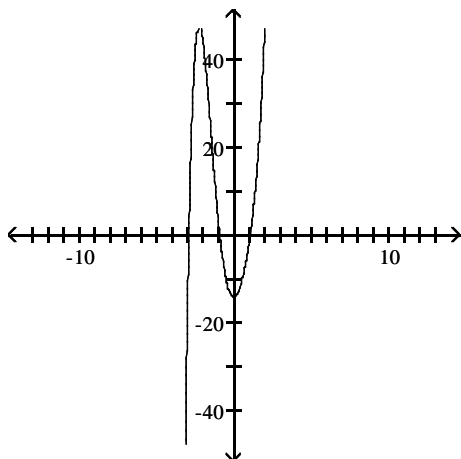
D) Quadratic; $339x^2$; 339; 2

Use the leading-term test to match the function with the correct graph.

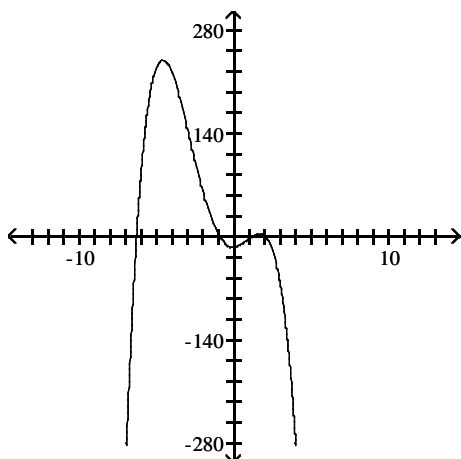
19) $f(x) = x^4 - 4x^3 + 15x^2 + x - 14$

19) _____

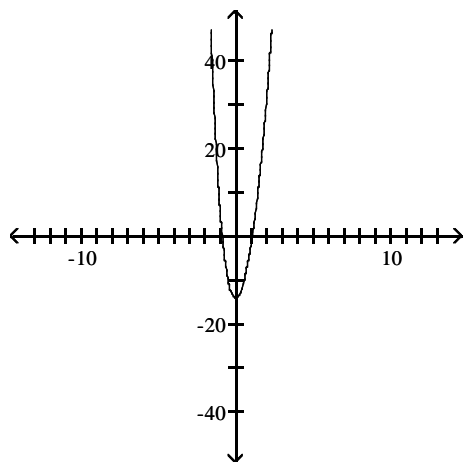
A)



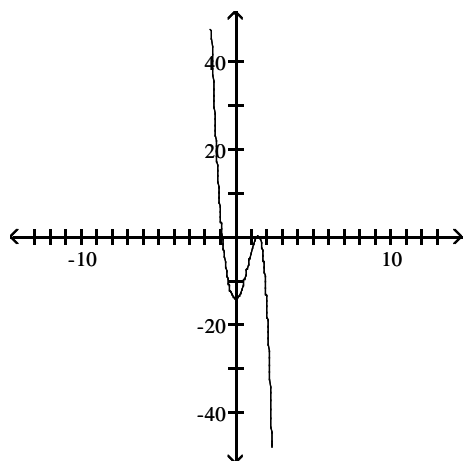
B)



C)



D)



Find the correct end behavior diagram for the given polynomial function.

20) $f(x) = 1.39x^4 + 2x^2 + x - 4$

20) _____

A) ↖ ↘

B) ↙ ↗

C) ↖ ↗

D) ↗ ↗

Answer Key

Testname: 131GRPREEVASS_3_1THRU3_4_AND4_1

- 1) D
Objective: (3.1) Add or Subtract Complex Numbers
- 2) D
Objective: (3.1) Simplify Powers of i
- 3) A
Objective: (3.1) Divide Complex Numbers
- 4) B
Objective: (3.1) Multiply Complex Numbers
- 5) C
Objective: (3.2) Solve Cubic Equation by Factoring
- 6) C
Objective: (3.2) Solve Quadratic Equation by Factoring or Square Root Principle
- 7) D
Objective: (3.2) Find x -Intercepts and Zeros from Graph
- 8) A
Objective: (3.2) Solve Quadratic Equation by Factoring or Square Root Principle
- 9) A
Objective: (3.3) Find Range
- 10) A
Objective: (3.3) Find Maximum or Minimum Value
- 11) A
Objective: (3.3) Find Maximum or Minimum Value
- 12) B
Objective: (3.3) Solve Apps: Quadratic Functions
- 13) C
Objective: (3.4) Solve Rational Equation
- 14) C
Objective: (3.4) Solve Radical Equation (One Radical)
- 15) C
Objective: (3.4) Solve Radical Equation (One Radical)
- 16) C
Objective: (3.4) Solve Radical Equation (Two Radicals)
- 17) C
Objective: (4.1) Find Zeros of Polynomial Function; State Multiplicities
- 18) B
Objective: (4.1) Classify Polynomial, Identify Leading Term and Degree
- 19) C
Objective: (4.1) Match Function to Graph
- 20) D
Objective: (4.1) Determine End Behavior of Polynomial Function