Math 90 Fall 2009
Test 3 (Chapters 8 and 9)

Name_____

Tests from past semesters are provided as a study preparation tool. As tests are created by different instructors, problems on current tests may differ. Sample tests are a good beginning point in your test preparation but it is recommended that you don't use sample tests as your only study resource.

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

Please provide the domain and range of the function.

1) $f(x) = \sqrt{x - 5}$ 1) _____

A) $[0, \infty); [5, \infty)$ B) $[5, \infty); [0, \infty)$ C) $[0, \infty); [-5, \infty)$ D) $[-5, \infty); [0, \infty)$

Simplify the expression. Assume that all variables represent positive real numbers.

2) $\left(\frac{9}{49}\right)^{-3/2}$ 2) _____

A) $\frac{343}{27}$ B) $\frac{49}{9}$ C) $\frac{27}{343}$ D) $\frac{9}{49}$

Simplify by first converting to rational exponents. Assume that all variables represent positive real numbers.

3) $\sqrt{z^{20}}$ 3) _____

A) z^{10} B) z^{40} C) $\frac{z}{2}$ D) $2z$

Express the radical in simplified form. Assume that all variables represent positive real numbers.

4) $-\sqrt{125k^7q^8}$ 4) _____

A) $-5k^3q^4\sqrt{5k}$ B) $5k^3q^4\sqrt{5k}$ C) $5k^7q^8\sqrt{5k}$ D) $-5k^3q^4\sqrt{5}$

Simplify. Assume that all variables represent positive real numbers.

5) $9\sqrt{7} + 4\sqrt{175}$ 5) _____

A) $29\sqrt{7}$ B) $-29\sqrt{7}$ C) $13\sqrt{7}$ D) $11\sqrt{7}$

Multiply, then simplify the product. Assume that all variables represent positive real numbers.

6) $(2 - 5\sqrt{5})^2$ 6) _____

A) $4 + 25\sqrt{5}$ B) $129 - 20\sqrt{5}$ C) $129 + 20\sqrt{5}$ D) $4 - 25\sqrt{5}$

Rationalize the denominator. Assume that all variables represent positive real numbers.

7) $\dfrac{3\sqrt{31x}}{\sqrt{x^3}}$ 7) _____

A) $3x\sqrt{31}$ B) $\dfrac{93}{x}$ C) $\dfrac{3\sqrt{31}}{x}$ D) $\dfrac{3\sqrt{31x}}{x}$

Solve this equation.

8) $\sqrt{x + 7} + 5 = x$ 8) _____

A) {2} B) {2, 9} C) {9} D) {9, 18}

Use the quadratic formula to solve the equation.

9) $3x^2 + 7x + 6 = 0$ 9) _____

A) $\left\{\frac{-7+\sqrt{23}}{6}, \frac{-7-\sqrt{23}}{6}\right\}$

B) $\left\{\frac{7+i\sqrt{23}}{6}, \frac{7-i\sqrt{23}}{6}\right\}$

C) $\left\{\frac{-7+i\sqrt{23}}{6}, \frac{-7-i\sqrt{23}}{6}\right\}$

D) $\left\{\frac{7+\sqrt{23}}{6}, \frac{7-\sqrt{23}}{6}\right\}$

Perform the indicated operation. Write the answer in the form a + bi.

10) $\frac{13+i}{1-i}$ 10) _____

A) 6 + 14i B) 7 + 7i C) 6 + 7i D) 6 + 6i

Use the square root property to solve the equation.

11) $(p-1)^2 = 13$ 11) _____

A) $\left\{\sqrt{13}-1, -\sqrt{13-1}\right\}$

B) $\left\{\sqrt{13}-\sqrt{-1}\right\}$

C) $\left\{1+\sqrt{13}, 1-\sqrt{13}\right\}$

D) $\left\{1+\sqrt{13}\right\}$

Solve the equation by completing the square.

12) $5x^2 + 8x = -1$ 12) _____

A) $\left\{\frac{-8+\sqrt{11}}{5}, \frac{-8-\sqrt{11}}{5}\right\}$

B) $\left\{\frac{-4+\sqrt{11}}{5}, \frac{-4-\sqrt{11}}{5}\right\}$

C) $\left\{\frac{-4+\sqrt{21}}{5}, \frac{-4-\sqrt{21}}{5}\right\}$

D) $\left\{\frac{-4+\sqrt{11}}{10}, \frac{-4-\sqrt{11}}{10}\right\}$

Simplify.

13) i^{17} 13) _____

A) –1 B) 1 C) i D) –i

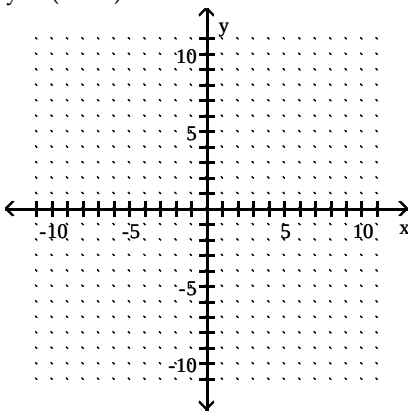
Identify the vertex of the given parabola.

14) $f(x) = -(x + 9)^2 - 3$ 14) _____

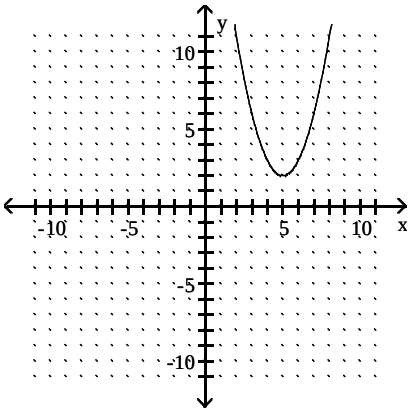
A) (9, –3) B) (–9, 3) C) (9, 3) D) (–9, –3)

Sketch the graph of the parabola.

15) $y = (x + 2)^2 - 5$ 15) _____



A)



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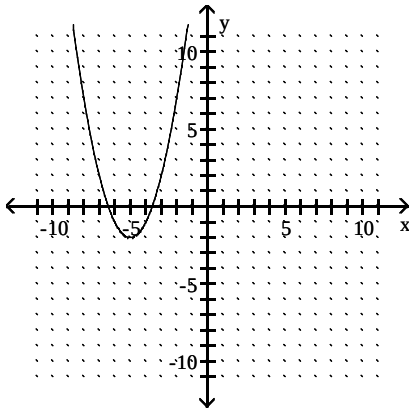
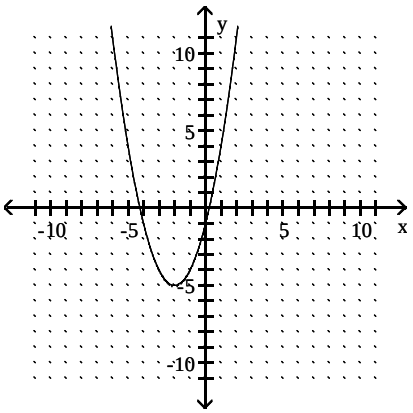
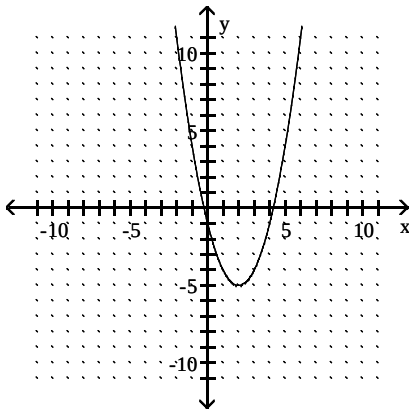


C)



D)



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

Solve the problem.

16) A jet plane traveling at a constant speed goes 1500 miles with the wind, then turns around and travels for 1300 miles against the wind. If the speed of the wind is 50 mph and the total flight took 4 hours, find the speed of the plane in still air. 16) _____

17) Ron can mow the lawn in two hours more time than Paul. Working together they can mow the lawn in 4 hours. How long does it take each of them working alone? Round your answers to the nearest tenth of an hour, if necessary. 17) _____

18) A projectile is thrown upward so that its distance (in feet) above the ground after t seconds is given by $h(t) = -12t^2 + 456t$. What is its maximum height? 18) _____

Solve the equation.

19) $\frac{7}{x - 4} = 1 + \frac{9}{x + 4}$ 19) _____

20) $x^4 + 5x^2 - 36 = 0$ 20) _____

1) B
2) A
3) A
4) A
5) A
6) B
7) C
8) C
9) C
10) C
11) C
12) B
13) C
14) D
15) C
16) 700 mph
17) Paul: 7.1 hr
    Ron: 9.1 hr
18) 4332 ft
19) {8, –10}
20) {2, –2, 3i, –3i}