Math 60: Final Review

Name_____

MULTIPLE CHOICE. Use scantron 882E. Choose the one alternative that best completes the statement or answers the question. If the answer is not listed mark E, for None of the above.

Solve the absolute value equation.

1) $|20x| = 72$ 1) _____

A) 3.6 B) 0, 3.6, –3.6 C) 3.6, –3.6 D) –3.6

Solve the equation.

2) $\frac{x+5}{5} - \frac{2x-12}{7} = 1$ 2) _____

A) 4 B) – 20 C) 20 D) –60

Solve.

3) A publisher printed 69 million pages in its production process last year. If this represents a 138% over the number of pages printed the previous year, how many pages were printed the previous year? (Round to the nearest hundredth million, if necessary.) 3) _____

A) 19,044 million pages B) 50 million pages

C) 190.44 million pages D) 500 million pages

4) Find the amount of money in an account after 10 years if a principal of $2300 is invested at 3.8% interest compounded quarterly. 4) _____

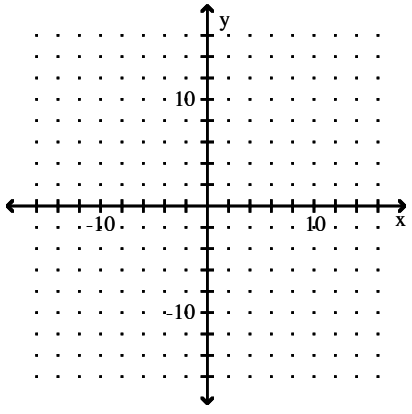
A) $3771.94 B) $3339.65 C) $3357.23 D) $3361.24

5) A diamond ring sold for $1929.60 including tax. If the tax rate where the diamond was purchased is 7.2%, find the price of the ring before the tax was added. (Round to the nearest cent, if necessary.) 5) _____

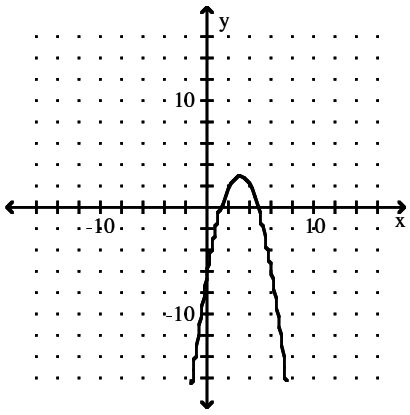
A) $138.93 B) $1800.00 C) $1790.67 D) $2068.53

Graph the function.

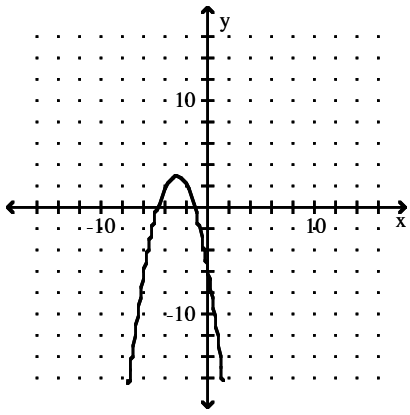
6) $f(x) = -(x-3)^2 + 3$ 6) _____



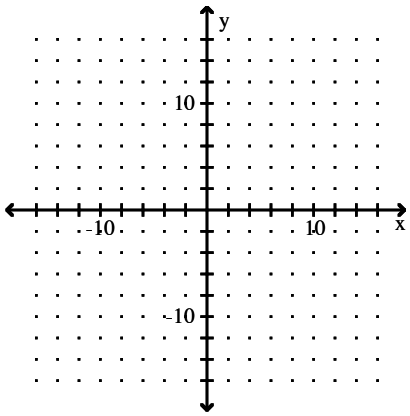
A)



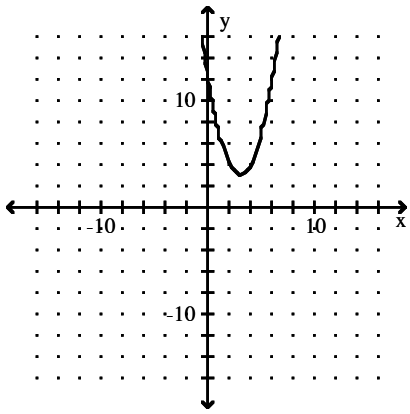
B)



C)



D)



Find the slope and the y–intercept of the line.

7) $f(x) = 3x$ 7) _____

A) $m = 0;\ b = 3$ B) $m = 3;\ b = 0$ C) $m = -3;\ b = 0$ D) $m = \frac{1}{3};\ b = 0$

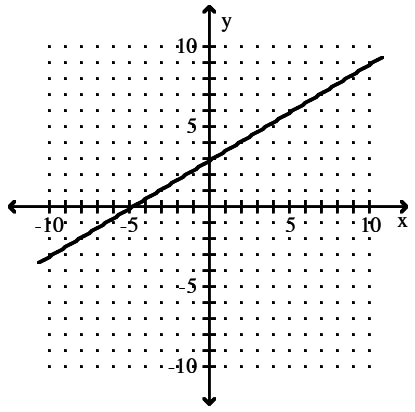
Find the slope of the line.

8) $x = -5$ 8) _____

A) 0 B) 5 C) undefined D) –5

Find the domain and the range of the relation. Use the vertical line test to determine whether the graph is the graph of a function.

9) 9) _____



A) domain: (−∞, ∞)
range: (−∞, ∞)
function

B) domain: (0, ∞)
range: (−∞, ∞)
not a function

C) domain: (−∞, ∞)
range: (−∞, ∞)
not a function

D) domain: (−∞, ∞)
range: (0, ∞)
function

Determine whether the ordered pair is a solution of the given equation.

10) $y = x^3$; (6, 18) 10) _____

A) Yes B) No

Determine whether the ordered pair is a solution of the system of linear equations.

11) (−3, −4), $\begin{cases} 4x = -16 - y \\ 2x = -22 - 4y \end{cases}$ 11) _____

A) Yes B) No

Given the cost function, C(x), and the revenue function, R(x), find the number of units x that must be sold to break even.

12) $C(x) = 9000x + 18{,}000$
$R(x) = 12{,}000x$ 12) _____

A) 7 units B) 2 units C) 6 units D) 8 units

Solve the system.

13) 13) _____

$$\begin{cases} x + y = 6 \\ -3x - 2y + 2z = -10 \\ x - z = 1 \end{cases}$$

A) (4, 2, 3) B) (3, 4, 2) C) (4, 3, 2) D) (3, 2, 4)

Multiply.

14) $\frac{1}{2}x^4y^2(10x - 7y + 6)$ 14) _____

A) $\frac{9}{2}x^4y^2$

B) $5x^5y^2 - \frac{7}{2}x^5y^3 + 3x^4y^2$

C) $5x^5y^2 - \frac{7}{2}x^4y^3 + 3x^4y^2$

D) $5x^5y^2 - \frac{7}{2}x^4y^3 + 3$

Simplify. Write the answer with positive exponents.

15) $(4^2)^3$ 15) _____

A) 1024 B) 48 C) 24 D) 4096

Perform the indicated operations.

16) $(2x + 7y)(2x - 7y)$ 16) _____

A) $4x^2 + 49y^2$

B) $4x^2 - 49y^2$

C) $4x^2 - 28xy - 49y^2$

D) $4x^2 + 28xy - 49y^2$

Divide.

17) $(-24x^2 - 22x + 7) \div (-4x + 1)$ 17) _____

A) $-24x + 7$ B) $6x + 7$ C) $x + 7$ D) $7x + 1$

Perform the indicated operation. If possible, simplify your answer.

18) $\frac{5x + 10}{x^2 + 11x + 28} + \frac{-6 - 4x}{x^2 + 11x + 28}$ 18) _____

A) $\frac{1}{x^2 + 11x + 28}$ B) $\frac{1}{x + 7}$ C) $\frac{1}{x + 4}$ D) $\frac{x - 4}{x^2 + 11x + 28}$

Write an equation to describe the variation. Use k for the constant of proportionality.

19) P varies directly as the square of R and inversely as the cube of S. 19) _____

A) $PR^2S^3 = k$ B) $P = \frac{kR^2}{S^3}$ C) $P = \frac{kS^3}{R^2}$ D) $P + R^2 - S^3 = k$

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

20) $\sqrt[3]{-64a^{14}b^{10}}$ 20) _____

A) $4\sqrt{a^{10}b^{14}}$ B) $-4a^4b^3\sqrt[3]{a^2b}$ C) $4a^2b\sqrt[3]{a^4b^3}$ D) $4ab\sqrt[3]{a^4b^5}$

Rationalize the numerator and simplify. Assume all variables represent positive real numbers.

21) $\frac{\sqrt{3}}{\sqrt{2x}}$ 21) _____

A) $\frac{\sqrt{6x}}{2x}$ B) $\frac{3}{\sqrt{3x}}$ C) $\frac{3}{\sqrt{2x}}$ D) $\frac{3}{\sqrt{6x}}$

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

22) $2i(7 - 2i)$ 22) _____

A) $-4 + 14i$ B) $14i + 4i^2$ C) $4 + 14i$ D) $14i - 4i^2$

Solve.

23) $\sqrt{4x + 1} = 5 - x$ 23) _____

A) 12 B) 2 C) 2, 12 D) ∅

Solve the equation by completing the square.

24) $4x^2 - 3x + 1 = 0$ 24) _____

A) $\frac{3 - i\sqrt{7}}{8}, \frac{3 + i\sqrt{7}}{8}$ B) $\frac{-3 - i\sqrt{7}}{8}, \frac{3 + i\sqrt{7}}{8}$

C) $\frac{-3 - i\sqrt{7}}{8}, \frac{-3 + i\sqrt{7}}{8}$ D) $\frac{3 - i\sqrt{7}}{8}, \frac{-3 + i\sqrt{7}}{8}$

Solve the inequality. Write the solution set in interval notation.

25) $\frac{1}{x - 4} < 1$ 25) _____

A) (4, 5) B) $(-\infty, 4)$ C) $(-\infty, 4] \cup [5, \infty)$ D) $(-\infty, 4) \cup (5, \infty)$

Solve.

26) $2 + \frac{5}{5x - 1} = -\frac{2}{(5x - 1)^2}$ 26) _____

A) $-2, -\frac{1}{2}$ B) $-\frac{1}{5}, -\frac{1}{10}$ C) $-\frac{1}{5}, \frac{1}{10}$ D) $-\frac{1}{5}, 0$

Use the square root property to solve the equation.

27) $x^2 - 3 = 0$ 27) _____

A) 9 B) $-\sqrt{3}, \sqrt{3}$ C) $\sqrt{3}$ D) $\frac{3}{2}$

Use the quadratic formula to solve the equation.

28) $7x^2 + 22x = -14$ 28) _____

A) $\frac{-11 - \sqrt{23}}{7}, \frac{-11 + \sqrt{23}}{7}$ B) $\frac{-11 - \sqrt{219}}{7}, \frac{-11 + \sqrt{219}}{7}$

C) $\frac{-22 - \sqrt{23}}{7}, \frac{-22 + \sqrt{23}}{7}$ D) $\frac{-11 - \sqrt{23}}{14}, \frac{-11 + \sqrt{23}}{14}$

Determine whether the function is a one–to–one function.

29) $f = \{(-2, 8), (2, -8), (6, -6), (-6, 6)\}$ 29) _____

A) one–to–one B) not one–to–one

Solve for x.

30) $\log_{2/5} x = 3$ 30) _____

A) $\frac{2}{5}$ B) $3^{2/5}$ C) $\frac{8}{125}$ D) $\frac{8}{5}$

The reliability of a new model of CD player can be described by the exponential function $R(t) = 2.7^{-(1/3)t}$, where the reliability R is the probability (as a decimal) that the CD player is still working t years after it is manufactured. Round the answer to the nearest hundredth. Then write your answer as a percent.

31) What is the probability that the CD player will still work $\frac{1}{3}$ of a year after it is manufactured? 31) _____

A) 12% B) 90% C) 37% D) 72%

For the given functions f and g, find the requested function.

32) If $f(x) = 4x^2 + 3x + 4$ and $g(x) = 3x - 8$, find $(g \circ f)(x)$. 32) _____

A) $12x^2 + 9x + 4$ B) $4x^2 + 3x - 4$ C) $12x^2 + 9x + 20$ D) $4x^2 + 9x + 4$

Solve the equation.

33) $\log_3 x^2 = \log_3 (6x + 16)$ 33) _____

A) ∅ B) $\frac{8}{3}$ C) 8 D) 8, –2

Find the center and the radius of the circle.

34) $x^2 + y^2 + 2x + 12y - 44 = 0$ 34) _____

A) center (–1, –6), radius = 9 B) center (1, 6), radius = 81

C) center (–6, –1), radius = 9 D) center (6, 1), radius = 81

Solve the nonlinear system of equations for real solutions.

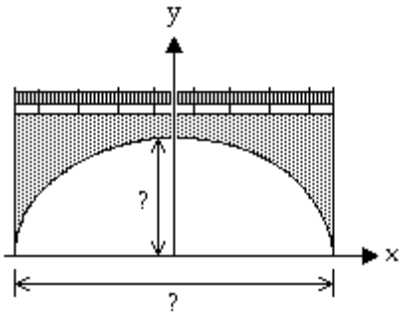
35) $\begin{cases} 16x - y = 6 \\ xy = 1 \end{cases}$ 35) _____

A) (8, –8), (–2, 2) B) ∅

C) $\left(-8, -\frac{1}{8}\right), \left(2, \frac{1}{2}\right)$ D) $\left(-\frac{1}{8}, -8\right), \left(\frac{1}{2}, 2\right)$

Solve.

36) A bridge has an arch in the shape of half an ellipse. If the equation of the ellipse, measured in feet, is $144x^2 + 400y^2 = 57{,}600$, find the height of the arch from the road and the width of the arch. 36) _____



A) height: 12 ft; width: 40 ft
B) height: 24 ft; width: 40 ft
C) height: 20 ft; width: 24 ft
D) height: 12 ft; width: 20 ft

Answer Key
Testname: MATH60FINALREVIEW

1) C
2) C
3) B
4) C
5) B
6) A
7) B
8) C
9) A
10) B
11) A
12) C
13) A
14) C
15) D
16) B
17) B
18) B
19) B
20) B
21) D
22) C
23) B
24) A
25) D
26) C
27) B
28) A
29) A
30) C
31) B
32) A
33) D
34) A
35) D
36) A