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MATH PLACEMENT TEST FOR BUSINESS  
SAMPLE TEST #3

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1. Perform the following operation and simplify:

$$-2x^2(x + 1) + 5x(x^2 - 9) - x^2(x + 4)$$

- A.  $2x^3 - 6x^2 - 45x$
  - B.  $6x^3 - 2x^2 - 45x$
  - C.  $2x^2 - 6x^4 - 45$
  - D. 0
  - E. None of the above
2. Factor completely the following Expression:

$$2(3 + 2x)^2 - 5(x - 4)(3 + 2x)$$

- A.  $2(3 + 2x) + 5(x - 4)$
  - B.  $7(3 + 2x)(x - 4)$
  - C.  $(3 + 2x)(-x + 26)$
  - D.  $(3 + 2x)(5x - 20)$
  - E. None of the above
3. Factor completely the following Expression:

$$(x - 6)^2 - 9$$

- A.  $(x - 9)(x - 3)$
- B.  $(x - 15)(x + 3)$
- C.  $(x - 9)(x + 3)$
- D.  $(x - 9)(3 - x)$
- E. None of the above

4. Perform the following operation assuming that  $x$  and  $y$  are positive real numbers. Write the answer using positive exponents only:

$$\left(\frac{y^{\frac{3}{2}}}{x^{\frac{1}{2}}y^3}\right)^{-3}$$

- A.  $x^{\frac{1}{2}}y^{\frac{9}{2}}$   
B.  $x^{\frac{3}{2}}y^{\frac{9}{2}}$   
C.  $\frac{x^{\frac{3}{2}}}{y^{\frac{9}{2}}}$   
D.  $x^{\frac{3}{2}}$   
E. None of the above

5. Perform the following operation and simplify:

$$\sqrt[3]{xy^5} \cdot \sqrt[3]{x^{16}y^8}$$

- A.  $x^5y^4\sqrt[3]{x^2y}$   
B.  $x^4y^5\sqrt[3]{x^2y}$   
C.  $x^5y^5\sqrt[3]{x^3y}$   
D.  $x^5y^{11}\sqrt[3]{xy^2}$   
E. None of the above

6. Perform the following operation, simplify and determine the domain of the resultant expression:

$$\frac{x^2 - 24x + 144}{x^2 - 144} \div \frac{4x - 48}{x + 12}$$

- A.  $\frac{1}{x + 12}, x \neq \pm 12$   
B.  $\frac{1}{4}, x \neq \pm 4$   
C.  $4, x \neq \pm 12$   
D.  $\frac{1}{4}, x \neq \pm 12$   
E. None of the above

7. Perform the following operation and simplify:

$$\frac{5x}{x+1} + \frac{6}{x-1} - \frac{10}{x^2-1}$$

- A.  $\frac{x+1}{x-1}$   
B.  $\frac{5x}{x-1}$   
C.  $\frac{5x-4}{x+1}$   
D.  $\frac{5x-4}{x-1}$   
E. None of the above

8. Simplify the following complex fraction:

$$\frac{\frac{49x^2 - 64y^2}{xy}}{\frac{7}{y} - \frac{8}{x}}$$

- A.  $7x + 8y$   
B.  $\frac{7x + 8y}{xy}$   
C.  $\frac{xy}{8x - 7y}$   
D.  $7x - 8y$   
E. None of the above

9. Rationalize the denominator of the following expression assuming that all variable are positive and the denominator is not 0:

$$\frac{4}{\sqrt{x+h} - \sqrt{x}}$$

- A.  $\frac{4(\sqrt{x+h} - \sqrt{x})}{h}$   
B.  $\frac{4(\sqrt{x+h} + \sqrt{x})}{h}$   
C.  $\frac{4\sqrt{h}}{h}$   
D.  $\frac{4\sqrt{x+h} + \sqrt{x}}{h}$   
E. None of the above

10. Solve the linear equation:

$$5[-5x - 7 - 6(x + 1)] = 2x + 7$$

A.  $x = -\frac{72}{57}$

B.  $x = -\frac{24}{19}$

C.  $x = -\frac{2}{57}$

D.  $x = -\frac{2}{5}$

E. None of the above

11. Solve for  $y$  the following equation:

$$8x - 6(x + y) = y - x$$

A.  $y = 3x - 7$

B.  $y = 3x$

C.  $y = \frac{3}{7}x$

D.  $y = -\frac{3x}{7}$

E. None of the above

12. Solve the following equation:

$$\frac{x}{2x + 2} = \frac{-2x}{4x + 4} + \frac{2x - 3}{x + 1}$$

A.  $x = -\frac{3}{2}$

B.  $x = 3$





C.  $x = -3$

D.  $x = \frac{2}{3}$

E. None of the above

13. Solve the following inequality, write your answer in Interval notation and graph it:

$$-14 < -3x + 4 \leq -2$$

- A.  $[-6, -2)$  
- B.  $(2, 6]$  
- C.  $[2, 6)$  
- D.  $(-6, -2)$  
- E. None of the above

14. Solve the following inequality, write your answer in Interval notation:

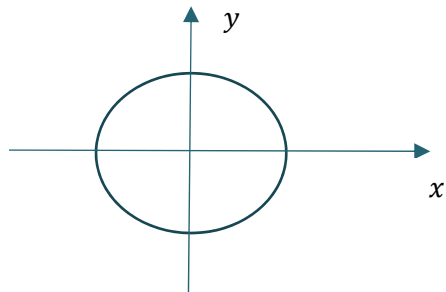
$$\frac{4}{x+5} \geq \frac{1}{x-1}$$

- A.  $[-1, 5] \cup [3, \infty)$
- B.  $(-5, 1) \cup [3, \infty)$
- C.  $[-5, 1] \cup [3, \infty)$
- D.  $(-5, 1) \cup (3, \infty)$
- E. None of the above
15. Solve the following System of Linear Equations:

$$\begin{cases} x + 3y = 0 \\ x - 3y = 24 \end{cases}$$

- A.  $x = 12, y = -4$
- B.  $x = -12, y = 4$
- C.  $x = -12, y = -4$
- D.  $x = 12, y = 4$
- E. None of the above
16. The total cost of producing  $x$  units from a certain product for which the fixed costs are \$2,400 and the cost per unit is \$10 is given by
- A.  $C = 2400 - 10x$
- B.  $C = 2400 + 10x$
- C.  $C = 10 + 2400x$
- D.  $C = 10x + 2400x$
- E. None of the above

17. Determine whether the following graph represents  $y$  as a function of  $x$



A. Yes

B. No

18. Find the domain of the following function:

$$f(x) = \frac{1}{x} - \frac{6x^2 - 7x + 12}{x^2 - 16}$$

- A. All real numbers  $x$  such that  $x = 0$
- B. All real numbers  $x$  such that  $x = 0$  and  $x = 4$
- C. All real numbers  $x$  such that  $x = 4$  and  $x = -4$
- D. All real numbers  $x$  such that  $x = 0, x = 4$  and  $x = -4$
- E. None of the above

19. Find the domain of the following function:

$$f(x) = \ln(x - 6)$$

- A. All real numbers
- B. All real numbers  $x$  such that  $x \neq 6$
- C. All real numbers  $x$  such that  $x > 6$
- D. All real numbers  $x$  such that  $x \geq 6$
- E. None of the above

20. Find  $f(x + h) - f(x)$  if  $f(x) = 4x^2 + x$

- A.  $8xh + 4h^2 + h + 2x$
- B.  $8xh + 4h^2 + h$
- C.  $8xh + 4h^2$
- D.  $8xh + 2x$
- E. None of the above

21. Find the  $y$  –intercept and  $x$  –intercepts (if any) for the following function:

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

- A.  $y$  –intercept at  $(0, -9)$  and  $x$  –intercept at  $(-3, 0)$
- B.  $y$  –intercept at  $(0, -9)$  and  $x$  –intercepts at  $(-3, 0)$  and  $(\frac{3}{2}, 0)$
- C.  $y$  –intercept at  $(-9, 0)$  and  $x$  –intercept at  $(0, -3)$  and  $(0, \frac{3}{2})$
- D.  $y$  –intercept at  $(0, -9)$  and no  $x$  –intercepts
- E. None of the above

22. Find the vertex of the following quadratic function and state if this vertex is a maximum or a minimum:

$$f(x) = \frac{1}{4}x^2 + 2x - 5$$

- A.  $(-4, -9)$ , Minimum
- B.  $(-4, -9)$ , Maximum
- C.  $(4, -9)$ , Minimum
- D.  $(8, 27)$ , Minimum
- E. None of the above

23. The profit from the sale of a  $x$  units from a certain product is modeled by the function:

$$P(x) = -x^2 + 52x - 73$$

How many items should be sold to realize the maximum profit?

- A. 47 units
- B. 23 units
- C. 27 units
- D. 26 units
- E. None of the above

24. Write the equation of the line passing through the points  $(2, 3)$  and  $(-3, 6)$

- A.  $3x - 5y = 21$
- B.  $6x + 5y = 21$
- C.  $3x + 5y = 21$
- D.  $3x + 5y = -21$
- E. None of the above

25. Write the equation of the line passing through the point  $(-8, 5)$  and parallel to the line given by the equation  $3x - 4y - 5 = 0$

- A.  $y = 3x + 11$
- B.  $y = \frac{3}{4}x + 11$
- C.  $y = -\frac{3}{4}x + 11$
- D.  $y = -\frac{3}{4}x - 11$
- E. None of the above

26. Write the following in Exponential form

$$\log(x) = a$$

- A.  $1^x = a$
- B.  $1^a = x$
- C.  $0^a = x$
- D.  $10^a = x$
- E. None of the above

27. Given that  $x, y, z$  and  $b$  are positive numbers, write the following expression as a sum and/or difference of logarithms of  $x, y$  and  $z$ .

$$\log_b \left( \sqrt[4]{\frac{x^3 y^2}{z^4}} \right)$$

- A.  $\frac{3}{4} \log_b(x) + \log_b(y) - \log_b(z)$
- B.  $\frac{3}{4} \log_b(x) + \frac{1}{2} \log_b(y) - \log_b(z)$
- C.  $\log_b(x) + \log_b(y) - \log_b(z)$
- D.  $\frac{3}{4} \log_b(x) - \frac{1}{2} \log_b(y) + \log_b(z)$
- E. None of the above

28. Solve the following logarithmic equation

$$\log_5(x) = 3$$

- A. 243
- B. 15
- C. 8
- D. 125
- E. None of the above



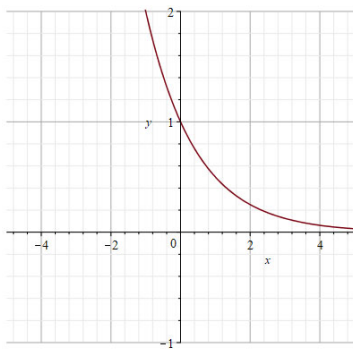
29. Solve the following Exponential Equation

$$16^x = 2$$

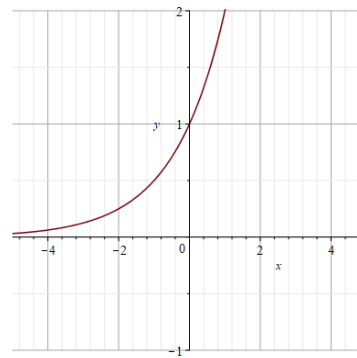
- A.  $x = \frac{1}{4}$
- B.  $x = 4$
- C.  $-4$
- D.  $-\frac{1}{4}$
- E. None of the above

30. Identify the graph of the function  $f(x) = 2^x$

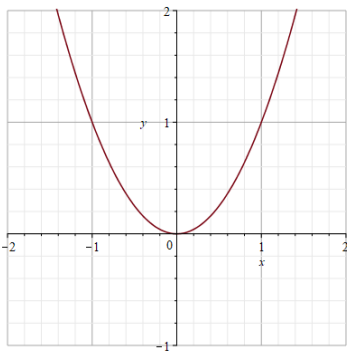
A.



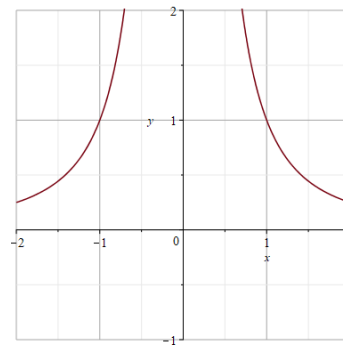
B.



C.



D.



E. None of the above

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PLACEMENT TEST FOR BUSINESS  
ANSWERS KEY SAMPLE TEST #3

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Question #	Answer	Question #	Answer
1	A	16	B
2	C	17	B
3	A	18	D
4	B	19	C
5	A	20	B
6	D	21	B
7	D	22	A
8	A	23	D
9	B	24	C
10	A	25	B
11	C	26	D
12	B	27	B
13	C	28	D
14	B	29	A
15	A	30	B