MATH PLACEMENT TEST FOR BUSINESS
SAMPLE TEST #4

1. Perform the following operation and simplify:

   $6(4x^3 + x^2 - 1) - 7(5x^3 - 2x + 2)$

   A. $-11x^3 + 6x^2 + 14x + 20$

   B. C. $-11x^3 + 6x^2 - 14x - 20$

   C. $-11x^3 + 6x^2 + 14x - 20$

   D. D. $-11x^3 + x^2 + 14x - 20$

   E. None of the above

2. Perform the following operation and simplify:

   $$\frac{x^2 + 7x + 10}{x^2 + 8x + 15} \cdot \frac{x^2 + 3x}{x^2 - 3x - 10}$$

   A. $\dfrac{x^2 + 3x}{x - 5}$

   B. $\dfrac{x}{x^2 + 8x + 15}$

   C. $\dfrac{1}{x - 5}$

   D. $\dfrac{x}{x - 5}$

   E. None of the above

3. Perform the following operation and simplify:

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

   A. $\dfrac{5 + x^3}{x^4 + 4}$

   B. $\dfrac{5 - x^3}{x^4 + 4}$

   C. $\dfrac{x^3 - 5}{x^4 + 4}$

   D. $\dfrac{5 + x^3}{x(x^4 + 4)}$

   E. None of the above

4. Factor completely the following Expression:

   $10x^2 + 25x + 6x + 15$

   A. $(5x - 3)(2x - 5)$
   B. $(10x - 3)(x - 5)$
   C. $(5x + 3)(2x + 5)$
   D. $(10x + 3)(x + 5)$
   E. None of the above

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

   $\left(\frac{xy^{-2}}{x^{-4}y}\right)^{-3}$

   A. $\frac{x^6}{y^{12}}$
   B. $\frac{y^9}{x^{15}}$
   C. $\frac{x^9}{y^{15}}$
   D. $\frac{y^6}{x^{12}}$
   E. None of the above

6. Write the following expression in radical form:

   $(16x)^{\frac{3}{5}}$

   A. $\sqrt[5]{16x^3}$
   B. $\sqrt[3]{(16x)^5}$
   C. $\sqrt[5]{(16x)^3}$
   D. $8\sqrt[5]{x^3}$
   E. None of the above

7. Perform the following operation and simplify:

$\sqrt[3]{16x} - 4\sqrt[3]{2x} - 2\sqrt[3]{54x}$

A. $-8\sqrt[3]{2x}$

B. $-8\sqrt[3]{4x}$

C. $9\sqrt[3]{2x}$

D. $\sqrt[3]{16x} - 10\sqrt[3]{2x}$

E. None of the above

8. Simplify the following expression:

$$\frac{\sqrt{x} - \dfrac{1}{6\sqrt{x}}}{\sqrt{x}}$$

A. $\dfrac{6\sqrt{x} - 1}{6x}$

B. $\dfrac{6x - 1}{6x}$

C. $\dfrac{6x + 1}{6x}$

D. $\dfrac{6x - 1}{6}$

E. None of the above

9. Solve the linear equation:

$$-\frac{2x}{5} + \frac{1}{2} = -\frac{x}{10} + \frac{1}{4}$$

A. $x = \dfrac{1}{11}$

B. $\dfrac{5}{6}$

C. $\dfrac{1}{2}$

D. -30

E. None of the above

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

$-3(4x-1) < -15x + 9$

A. $(-\infty, 2)$

B. $(-\infty, -15]$

C. $(-15, \infty)$

D. $(2, \infty)$

E. None of the above

11. Solve the following inequality and write your answer in Interval notation:

$\left|\frac{5-4x}{6}\right| \leq 2$

A. $\left(-\infty, -\frac{7}{4}\right) \cup \left[\frac{17}{4}, \infty\right)$

B. $\left(-\infty, -\frac{7}{4}\right] \cup \left(\frac{17}{4}, \infty\right)$

C. $\left[-\frac{7}{4}, \frac{17}{4}\right]$

D. No solution

E. None of the above

12. Solve the following quadratic equation:

$3x(x+1) = 1$

A. $x = \frac{1}{2}$

B. $x = \frac{-3+\sqrt{21}}{6}, \quad x = \frac{-3-\sqrt{21}}{6}$

C. $x = \frac{3+\sqrt{21}}{6}, \quad x = \frac{3-\sqrt{21}}{6}$

D. $x = 0, \quad x = \frac{1}{3}$

E. None of the above

13. Solve the following quadratic Inequality, write your answer in interval notation and graph it:

$x^2 - 8 \leq 7x$

A. $[-8, 1]$

B. $[-1, 8]$

C. $[-8, -1]$

D. $[1,\ 8]$

E. None of the above

14. The fixed costs of a company producing calculators are $\$25{,}000$ and it costs $\$20$ to produce one calculator. How many calculators were produced if the costs is $\$39{,}000$?

A. 1950 calculators

B. 1250 calculators

C. 700 calculators

D. 1825 calculators

E. None of the above

15. Determine whether the equation $x = y^2 + 15$ defnes y as a function of x

A. Yes B. No

16. Find the domain of the following function:

$$f(x) = \frac{3x^2 - 6x}{\sqrt{6 - x}}$$

A. All real numbers x such that $x \neq 6$

B. All real numbers x such that $x \neq 2, x \neq 0$ and $x \neq 6$

C. All real numbers x such that $x \leq 6$

D. All real numbers x such that $x < 6$

E. None of above

17. If $f(x) = 5x^2 + x + 1$, find

$$\frac{f(2+h) - f(2)}{h}$$

A. 0
B. $5h^2 + 21h$
C. $21 + 5h$
D. $5h$
E. None of the above

18. Write the following quadratic equation in the form $y = a(x-h)^2 + k$:

$f(x) = x^2 + 10x + 18$

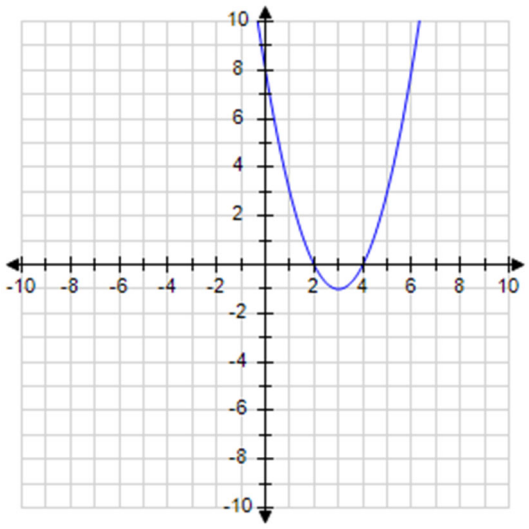
A. $(x+5)^2 - 7$
B. $(x-5)^2 - 7$
C. $(x+5)^2 + 7$
D. $(x-5)^2 + 7$
E. None of the above

19. Determine whether the following function has a maximum or a minimum and find its value:

$f(x) = -x^2 - 18x - 90$

A. Minimum, -9
B. Maximum, 9
C. Minimum, 0
D. Maximum , -9
E. None of the above

20. Given the following Graph, Find the coordinates of the vertex and the intercepts:



A. vertex $(3, -1)$; x −intercepts 4, 2; y-intercept 8

B. vertex $(3, -1)$; x −intercepts 8; y-intercepts 2, 4

C. vertex $(-1, 3)$; x −intercepts 4, 2; y-intercept 8

D. vertex $(2, 4)$; x −intercepts 3; y-intercept -1

E. None of the above

21. The fixed costs of a company producing pants are $\$50{,}000$. If the selling price of the company is $\$90$ per pant, what is the revenue functions $R(x)$ coming from the sale of x pants?

A. $R(x) = 50000 + 9x$
B. $R(x) = 9x$
C. $R(x) = 50000x - 9$
D. $R(x) = 9x - 50000$
E. None of the above

22. The revenue from the sale of x thousands units from a certain product is modeled by the function $R(x) = -2x^2 + 42x + 7$. If the cost of producing x thousands units is modeled by $C(x) = 30x + 23$, how many items should be produced and sold for the company to beak even?

A. $x = 400$ units
B. $x = 2,\ x = 4$ units
C. $x = 2000,\ x = 4000$ units
D. $x = 0,\ x = 4$ units
E. None of the above

23. Find the slope and the y −intercept of the line given by the equation

$6x - 2y = -4$

A. $m = 6; y$ −intercept $(0, -4)$
B. $m = 3; y$ −intercept $(0, 2)$
C. $m = 3; y$ −intercept $(2, 0)$
D. $m = -2; y$ −intercept $(0, 2)$
E. None of the above

24. Write the equation of the line passing through the point $(-2, 5)$ and perpendicular to the line given by the equation $5x + 10y - 8 = 0$

A. $y = \frac{1}{2}x + 6$
B. $y = -2x + 1$
C. $y = 2x + 9$
D. $y = -\frac{1}{2}x + 4$
E. None of the above

25. Write the equation of the vertical line passing through the point $(-5, 6)$

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

26. Write the following in logarithmic form (do not solve):

$10^{3x+1} = 5$

A. $3x + 1 = log(5)$
B. $3x + 1 = \ln(5)$
C. $3x + 1 = \log(10)$
D. $3x + 1 = \ln(10)$
E. None of the above

27. Given that $x, y, z \; and \; b$ are positive numbers, write the following expression in condensed form (as a single log)

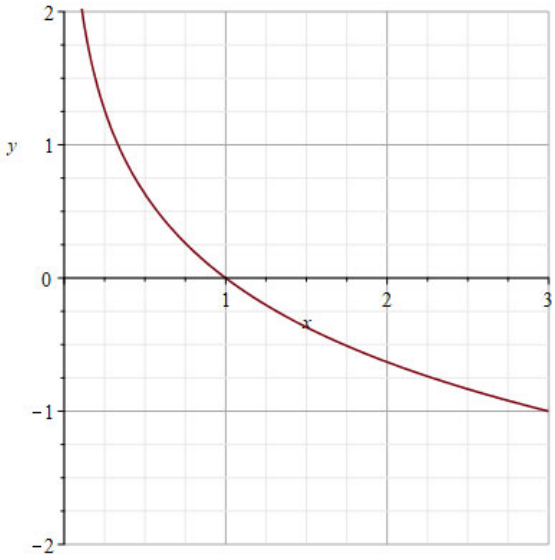
$log_4(x) - log_4(y) + 5log_4(z)$

A. $log_4(x - y + z^5)$
B. $log_4(x - y + 5z)$
C. $log_4\left(\frac{x+5z}{y}\right)$
D. $log_4\left(\frac{xz^5}{y}\right)$
E. None of the above

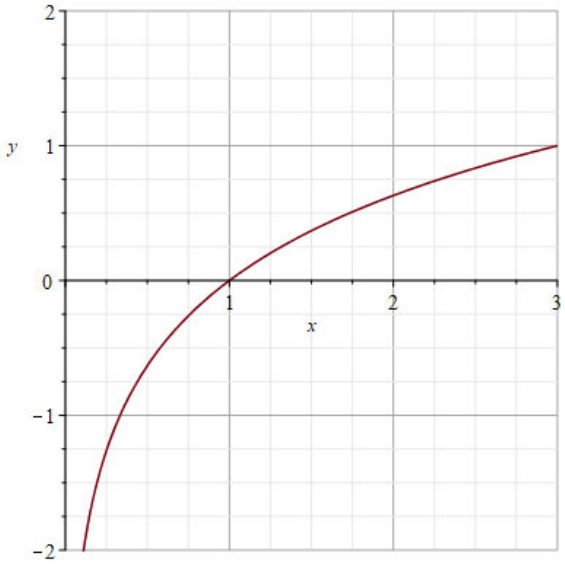
28. Find the domain and graph the following function:

$f(x) = \log_{\frac{1}{3}} x$

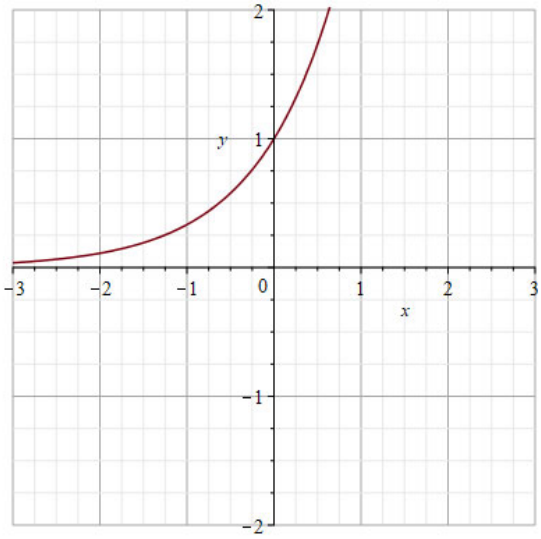
A. Domain $(0, \infty)$



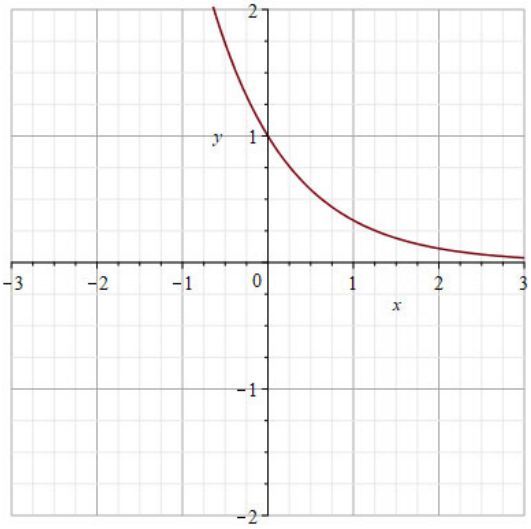
B. Domain= $(-\infty, \infty)$



C. Domain $(-\infty, \infty)$



D. Domain= $(0, \infty)$



E. None of the above

29. Solve the following exponential equation:

$2^{12-2x} = 64$

A. $x = 3$
B. $x = 6$
C. $x = 32$
D. $x = -3$
E. None of the above

30. Solve the following logarithmic equation:

$4\ln(e^{2x}) = 64$

A. $x = 16$
B. $x = 8$
C. $x = 32$
D. $x = 128$
E. None of the above

MATH PLACEMENT TEST FOR BUSINESS
ANSWERS KEY SAMPLE TEST #4

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