TMATYC

Developmental Algebra Exam

Fall 2010

1. If $\frac{2}{x+5}=\frac{6}{15}$ then x =

   A. 10 B. 6 C. 3 D. 0

2. Sue gets a new job. After 6 months, she gets a raise of 20%. Six months after this she takes a pay cut of 10%. After one year on the job, Sue is making what percent of her starting salary?

   A. 150% B. 110% C. 112% D. 108%

3. Three times the sum of a number and 9 is four less than the square of the number. If the number is n then this statement would be written algebraically as

   A. $3n+9=n^2-4$ B. $3(n+9)=(n-4)^2$ C. $3\left(n+9\right)=n^2-4$ D. $3n+9=(n-4)^2$

4. The data in the table below models a linear function. Find the values of a, b, and c.

x	-4	-2	b	5	7
$f(x)$	a	4	3.5	0.5	c

   A. a = 2, b = 1, c = -0.5 B. a = 5, b = -1, c = -0.5 C. a = 4, b = -2, c = 1 D. a = 0, b = -1, c = 2

5. In football a field goal is worth 3 points and a touchdown with the kicked extra point is worth 7 points. In a game between two football teams the combined score was 73 and the total number of field goals for both teams was six less than twice the total number of touchdowns. Assuming every touchdown was with a kicked extra point, then the total number of field goals for both teams was

   A. 22 B. 15 C. 12 D. 8

6. If the ordered pair (3,-4) satisfies the inequality $5x-k\geq 2y$ then which of the following must be true?

   A. $k\leq 7$ B. $k\geq 7$ C. $k=23$ D. $k\leq 23$

7. Factor $18x^3-33x^2-30x$ completely

   A. $3\left(3x-2\right)\left(3x+5\right)$ B. $3x\left(3x+2\right)\left(2x-5\right)$ C. $3x\left(6x+5\right)\left(x-2\right)$ D. $x\left(9x+10\right)\left(2x-3\right)$

8. The vertex of a parabola is (2,5). If the point (-1,14) is a point on this parabola, then another point on this parabola is

   A. (5,14) B. (0.5, 9.5) C. (0,6) D. (3,7)

9. Find the domain of the function $h(x)=\dfrac{\sqrt{x^2-4}}{x-2}$.

A. $\{x \mid x \geq 2\}$ B. $(-\infty,\infty)$ C. $\{x \mid x \neq 2\}$ D. $(-\infty,-2]\cup(2,\infty)$

10. A present is placed in a box to be wrapped. If the box measures 1 foot by 2 feet by 8 inches, what is the minimum amount of wrapping paper needed to wrap the entire box?

A. 8 ft^2 B. 16 ft^2 C. 22 ft^2 D. 96 ft^2

11. Rounded to the nearest hundredth, the expression $44\% \times 17\% - 99\% \times 1.7\% + 0.2\%$ is

A. 0.04 B. 0.05 C. 0.06 D. 0.07

12. Evaluate the expression $x^2 - 2xy - y^2$ if x = -2 and y = -1.

A. -7 B. -1 B. 1 C. 9

13. Solve the following inequality: $3(2-x)-2(x-3) \leq 17$

A. $(-\infty,-1]$ B. $[-1,\infty)$ C. $[-\frac{14}{5},\infty)$ D. $[-6,\infty)$

14. Starting at 12 noon, water is pumped into a tank at a rate of 5 gallons per minute. At the same time the tank is drained at the rate of 30 gallons per hour. At 3 pm, the tank contains 900 gallons of water. How many gallons of water were in the tank at 12 noon?

A. 90 B. 270 C. 300 D. 1,710

15. One leg of a right triangle is 14 inches longer than the other leg. If the area enclosed by this triangle is 120 square inches, what is the length of the hypotenuse (in inches)?

A. 14 B. 18 C. 24 D. 26

16. The drag, *D*, (in pounds) on an airplane is given by $D = 0.0013v^2 + 0.02v$ where *v* is the airplane's velocity in miles per hour. If the drag on such an airplane is 450 pounds, then its velocity rounded to the nearest mile per hour is

A. 272 B. 581 C. 588 D. 596

17. Assuming that *a* and *b* are nonzero real numbers, which of the following statements is true?

A. $\dfrac{1}{a}+\dfrac{1}{b}=\dfrac{1}{a+b}$ B. $\dfrac{a+b}{a}=b$ C. $\dfrac{a}{a+b}=1+\dfrac{1}{b}$ D. $\dfrac{a+b}{a}=1+\dfrac{b}{a}$

18. Which of the following expressions is the largest?

A. $\left|\left|-3\right|-\left|-5\right|\right|$ B. $-\left|-3-5\right|$ C. $\left|-3\right|-\left|-5\right|$ D. $\left|5-3\right|+\left|3-5\right|$

19. Which of the following is true?

A. $2^{-3} > 2^{-4}$ B. $3^{-2} > 2^{-3}$ C. $\left(-4\right)^{6} = 4^{-6}$ D. $4^{3} \cdot 4^{-3} > 3^{4} \cdot 3^{-4}$

20. $20 - 4^{2} \div 2 + 5 \times 2^{3} =$

A. 42 B. 46 C. 52 D. 56

21. Find the value of *a* such that the equation $\frac{7x+6}{a} - 2x = 15$ will have the solution $x = 8$.

A. 0.5 B. 1 C. 2 D. 3

22. Solve the formula $z = \frac{x-m}{s}$ for *x*.

A. $x = m - sz$ B. $x = m + sz$ C. $x = \frac{z-m}{s}$ D. $x = m + s + z$

23. Including 9.25% tax, your bill for lunch is $13.11. Find the cost of your lunch before the tax is added.

A. $11.90 B. $12.00 C. $12.02 D. $12.18

24. If $f\left(x\right) = 4y - 3x$ then find the value of *y* if $f\left(-2\right) = 26$.

A. 5 B. 7.25 C. 8 D. 10

25. If $x^{2} - y^{2} = 20$ and $x - y = -10$ then $x + y =$

A. -6 B. -2 C. 4 D. 10