

TMATYC - Basic Algebra Test - 2013

1. If $\frac{2}{b} = \frac{3}{2ak}$ then $k =$
 A. $\frac{3b}{4a}$ B. $\frac{3}{ab}$ C. $\frac{4a}{3b}$ D. $\frac{3}{4ab}$ E. $\frac{3ab}{4}$
2. The domain of the function $f(x) = \sqrt{6 - 2x}$ is
 A. $x > 0$ B. $x \geq 6$ C. $x \leq 3$ D. $x \leq 6$ E. $x \neq 3$
3. In which quadrant do the lines $x = 3$ and $y = -4$ intersect?
 A. I B. II C. III D. IV E. none of these
4. The equation $-mx + 1 = 13 - 4(x + 3)$ is an identity if $m =$
 A. 4 B. -4 C. 1 D. -1 E. -9
5. Which of these inequalities has NO solutions?
 A. $7x + 4 > 3$ B. $-100x + 5 \geq 8$ C. $x + 5 < -2$ D. $|x - 1| > -1$ E. $|x + 3| < -2$
6. The lines $y = (a - 5)x + 5$ and $y = -2x + 7$ are perpendicular if $a =$
 A. 5 B. 3 C. $\frac{1}{2}$ D. $\frac{9}{2}$ E. $\frac{11}{2}$
7. If Lenny is 6 years older than Sue, and John is 5 years older than Lenny, and the total of their three ages is 41, then how old is Sue?
 A. 8 B. 10 C. 11 D. 14 E. 19
8. If 10% of a is b , then $a =$
 A. $0.1b$ B. b C. $9b$ D. $10b$ E. $1.1b$
9. Let $y = 2 - x - x^2$. If $x = -2$ then $y =$
 A. -2 B. 0 C. 2 D. 4 E. 8
10. Simplify the exponential expression $\left(\frac{x^3y^{-2}}{2x^{-3}yz}\right)^{-2}$
 A. $\frac{4y^6z^2}{x^{12}}$ B. $\frac{y^2}{4z^2}$ C. $4y^2z^2$ D. $\frac{-x^6y^4}{4z^2}$ E. $\frac{4x^{12}z^2}{y^2}$
11. Which one of the following is false?
 A. $\sqrt[3]{-8}$ is a real number B. $\sqrt{x^2 + y^2} = x + y$ C. $2^{1/2} \cdot 2^{1/2} = 2$ D. $2^{-3} = \frac{1}{8}$ E. $(xy)^3 = x^3y^3$
12. An object is thrown upward with an initial velocity of 14 feet per second. Its height t seconds after being thrown is given by $h(t) = -14t^2 + 84t$. After how many seconds does it hit the ground?
 A. 2 B. 3 C. 6 D. 7 E. 9
13. If $xy = 4$ and $xy^2 = 16$, then what is the value of x ?
 A. 1 B. 2 C. 4 D. 8 E. 12

14. The relationship between quantities m and n is expressed by the equation $11m = 5(n - 42)$. If the difference between the two chosen values of n is 30, what is the difference in the corresponding values of m ?
- A. $\frac{5}{11}$ B. $\frac{30}{11}$ C. $\frac{42}{11}$ D. $\frac{60}{11}$ E. $\frac{150}{11}$
15. One faucet can fill a tank in 3 hours, a second faucet can fill the tank in 5 hours, and the drain can empty the tank in 7.5 hours. Assuming all filling and emptying occurs at constant rates, how many hours will it take to fill the tank if both faucets operate and the drain is open?
- A. 1.5 B. 2 C. 2.5 D. 4 E. It will never fill
16. A line has slope 2 and the sum of its intercepts is k . If the line is shifted vertically upward by 4 units, the sum of the intercepts of the shifted line is
- A. $k + 2$ B. $k + 4$ C. $k + 8$ D. $k - 2$ E. $4k$
17. If $f(x - 2) = 3x + 4$ then $f(1) =$
- A. 13 B. 7 C. 1 D. -1 E. Cannot be determined
18. Which of the following is true?
- A. $5 + 3(x - 4) = 8(x - 4)$ B. $3 - (-2)^2 = 7$ C. $-x - x = (-x) + (-x)$
- D. $5 - 3 \times 3 = 6$ E. $3^0 = 0$
19. At the beginning, 200 people were sitting in a large room. Fifty percent of the people left the room. Then the number of people in the room was increased by 50%. Finally, 50% of the people in the room left. At the end, how many people were still in the room?
- A. 50 B. 75 C. 100 D. 150 E. 175
20. The product xyz is zero but the product xz is not zero. Which of the following must be true?
- A. $y > 0$ B. $x < 0$ C. $z > 0$ D. $x = 0$ E. $y = 0$
21. Find b such that $\frac{7x+4}{b} + 13 = x$ will have a solution set given by $\{-6\}$
- A. -7 B. $\frac{7}{13}$ C. 2 D. $\frac{74}{13}$ E. Not enough information to find b
22. Find the area of the rectangle with vertices A(2,3), B(2,6), C(8,6) and D(8,3). The area in square units is
- A. 9 B. 13 C. 16 D. 18 E. 48
23. If the solutions to the equation $x^2 + ax + b = 0$ are $x = 2$ and $x = -4$, then $a + b =$
- A. -6 B. -2 C. 4 D. 8 E. 10
24. If x represents a number, which expression represents four less than six times the sum of the number and eight?
- A. $4 - (6x + 8)$ B. $4 - 6x + 8$ C. $(6x + 8) - 4$ D. $4 - 6(x + 8)$ E. $6(x + 8) - 4$
25. If 3 poofs = 1 gaw, 4 gaws = 3 bips, and 1 bip = 5 kads, then 16 poofs =
- A. 4 kads B. 12 kads C. 20 kads D. 36 kads E. 180 kads