

**Algebra 2 - "Mini ACT" (25 questions - ID 514)****Multiple Choice**

Identify the letter of the choice that best completes the statement or answers the question.

- On a trip of 525 miles, how many minutes faster is it to travel at 60 miles per hour rather than 50 miles per hour?  
a. 95 min b. 85 min c. 115 min d. 105 min e. 75 min
- Two bags each contain three number tiles, a 1, a 2, and a 3. If you pull one tile from each bag and add the two numbers together, what are the odds of getting a sum of 3?  
a. 1 : 8 b. 2 : 9 c. 3 : 6 d. 2 : 7 e. 1 : 9
- 180 is 45% of what number?  
a. 81 b. 145 c. 204 d. 400 e. 340
- During the last 10 years, the population of a town increased from 6000 to 10,320. What percent increase does this represent?  
a. 80% b. 72% c. 75% d. 78% e. 70%
- A dance company is planning a program that will consist of one ballet, one tap, and one jazz routine. In its repertoire are five ballet, three jazz, and six tap routines. How many different programs are possible?  
a. 56 b. 90 c. 14 d. 28 e. 72
- After  $\frac{4\frac{4}{9}}{1\frac{1}{5}}$  has been simplified to a mixed number in lowest terms, what is the numerator of the fraction?  
a. 19 b. 16 c. 18 d. 20 e. 22
- $\sqrt{\frac{1}{9}} - \sqrt{\frac{1}{36}} = ?$   
a.  $-\sqrt{\frac{1}{27}}$  b.  $\frac{1}{6}$  c.  $-3$  d.  $\sqrt{\frac{1}{12}}$  e.  $\frac{1}{2}$
- $\frac{3}{5} + \frac{1}{3} = ?$   
a.  $\frac{4}{5}$  b.  $\frac{8}{15}$  c.  $\frac{1}{2}$  d.  $\frac{4}{15}$  e.  $\frac{14}{15}$
- A 150-pound person contains approximately 0.00024 pounds of the element cobalt. Express this weight of cobalt in scientific notation.  
a.  $0.24 \times 10^{-3}$  b.  $24 \times 10^{-4}$  c.  $2.4 \times 10^4$  d.  $2.4 \times 10^{-3}$  e.  $2.4 \times 10^{-4}$
- Which of these expressions represents the greatest number?  
a.  $|-11 + (-4)| - |-4|$  b.  $-|7 - 3| + |-9 - 11|$  c.  $|-8 + (-2)| + |-7|$  d.  $|-6 - (-12)| - 4$   
e.  $-|-8| + |-9| + |4 - 8|$
- $4^0 + 3^{-1} + 2^{-2} + 1^{-3} = ?$   
a.  $2\frac{7}{12}$  b.  $3\frac{7}{12}$  c.  $3\frac{1}{12}$  d.  $2\frac{1}{12}$  e.  $\frac{7}{12}$
- Solve  $0.2(0.4 - x) = 0.6$ .  
a. 0.1 b. 3.4 c. 2.4 d. -1.8 e. -2.6

13. Evaluate  $a(a - \sqrt{b})^{-1}$  when  $a = 4$  and  $b = \frac{1}{4}$ .  
 a.  $\frac{8}{7}$  b.  $\frac{7}{4}$  c.  $-\frac{7}{2}$  d.  $\frac{4}{7}$  e. 14
14.  $a^{\frac{1}{2}} a^{\frac{2}{3}} = ?$   
 a.  $a\sqrt{a}$  b.  $\sqrt[3]{a}$  c.  $a^6\sqrt{a}$  d.  $a^3\sqrt{a}$  e.  $\sqrt[3]{a}$
15. Which of the following quadratic equations has two real solutions?  
 a.  $x^2 + 5x + 8 = 0$  b.  $2x^2 - 5x + 3 = 0$  c.  $3x^2 - 3x + 2 = 0$  d.  $2x^2 - 4x + 3 = 0$  e.  $3x^2 - 2x + 1 = 0$
16. If  $P = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$  and  $Q = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ , find  $P \cdot Q$ .  
 a.  $\begin{bmatrix} 5 & 10 \\ 13 & 5 \end{bmatrix}$  b.  $\begin{bmatrix} 5 & 3 \\ 7 & 5 \end{bmatrix}$  c.  $\begin{bmatrix} 5 & 13 \\ 3 & 5 \end{bmatrix}$  d.  $\begin{bmatrix} 6 & 10 \\ 5 & 6 \end{bmatrix}$  e.  $\begin{bmatrix} 6 & 6 \\ 5 & 6 \end{bmatrix}$
17. Solve  $|3x + 2| \leq 5$ .  
 a.  $x \geq 1$  or  $x \leq -\frac{7}{3}$  b.  $x \leq -1$  or  $x \geq \frac{7}{3}$  c.  $-1 \leq x \leq \frac{7}{3}$  d.  $-\frac{7}{3} \leq x \leq 1$  e.  $1 \leq x \leq \frac{7}{3}$
18. Which of the following sets of numbers could *not* represent the lengths of the sides of a triangle?  
 a. 3.6, 4.2, 7.5 b. 5.1, 6.4, 11.7 c. 2.9, 8.3, 10.1 d. 5.5, 6.5, 10.5 e. 1.6, 9.2, 9.2
19. How many revolutions does it take for a 6-inch diameter wheel to travel 15 feet?  
 a.  $\frac{10}{x}$  b.  $\frac{5}{6x}$  c.  $\frac{30}{x}$  d.  $\frac{15}{x}$  e.  $\frac{5}{x}$
20. Simplify the expression  $\csc \theta \cos \theta \tan \theta$ .  
 a.  $\sin \theta \cot \theta$  b.  $\cot \theta$  c.  $\frac{\cos^2 \theta}{\sin^2 \theta}$  d. 1 e.  $\sec \theta$
21. A 10-foot board is used as a ramp from a doorway down to the ground. If the vertical drop from the doorway to the ground is 9 inches, which expression gives the measure of the angle the ramp makes with the ground?  
 a.  $\sin^{-1} 0.9$  b.  $\cos \frac{9}{10}$  c.  $\sin^{-1} 0.075$  d.  $\tan^{-1} 0.075$  e.  $\tan^{-1} 0.75$
22. Which of the following equations represents a line has slope 3 and passes the point at  $(-4, -1)$ ?  
 a.  $x + 3y = -7$  b.  $3x - y = -11$  c.  $3x + y = -13$  d.  $3x + y = 11$  e.  $x - 3y = -1$
23. What are the coordinates of the center of the circle with equation  $x^2 - 6x + y^2 + 4y = 20$ ?  
 a.  $(2, -3)$  b.  $(3, -2)$  c.  $(-3, 2)$  d.  $(3, 2)$  e.  $(-2, -3)$
24. What is the distance between the center of the circle  $(x - 1)^2 + (y + 4)^2 = 16$  the vertex of the parabola  $y - 4 = (x - 1)^2$ ?  
 a. 4 b. 6 c. 2 d. 8 e. 10
25. What is the distance between the points at  $(-2, 5)$  and  $(2, -1)$ ?  
 a.  $4\sqrt{3}$  b.  $2\sqrt{13}$  c.  $6\sqrt{2}$  d.  $2\sqrt{15}$  e. 8

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**Answer Section**

**MULTIPLE CHOICE**

1. D
2. D
3. D
4. B
5. B
6. A
7. B
8. E
9. E
10. C
11. A
12. E
13. A
14. C
15. B
16. D
17. D
18. B
19. C
20. D
21. C
22. B
23. B
24. D
25. B