

**ACT Practice Test 2 Section 1**  
**Time—60 minutes, 60 Questions**

**DIRECTIONS:** Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for the test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

**Notes:** Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

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1. A store buys an item and increases the price 80% before it is sold to the consumer. If the original price was \$40, how much does the consumer pay?

- A. \$32
- B. \$44
- C. \$48
- D. \$72
- E. \$360

**DO YOUR FIGURING HERE.**

2. Which of the following is the best approximation of  $\frac{3(11)^2}{\sqrt{143}}$ ?

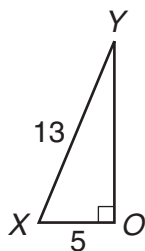
- F. 30
- G. 65
- H. 73
- J. 91
- K. 102



**ACT Practice Test 2 Section 1** *continued*

3. Mr. Smith has 40 students in his class. If 22 of the students are boys, what is the ratio of girls to boys?

- A.  $\frac{9}{40}$   
B.  $\frac{9}{20}$   
C.  $\frac{11}{20}$   
D.  $\frac{9}{11}$   
E.  $\frac{11}{9}$

**DO YOUR FIGURING HERE.**

4. What is the area of triangle  $XOY$ ?
- F. 30  
G. 32.5  
H. 50.5  
J. 60  
K. 65
5. What is an equation of the line that passes through the origin and the point (4, 5)?
- A.  $y = \frac{4}{5}x$   
B.  $y = \frac{4}{5}x + 4$   
C.  $y = \frac{4}{5}x + 5$   
D.  $y = \frac{5}{4}x$   
E.  $y = \frac{5}{4}x + 5$

**GO ON**

**ACT Practice Test 2 Section 1** *continued*

6. Which of the following is equivalent to  $3(c)(c)(c)(c)(c)(c)(c) + 8(c)(c)(c)(c)(c)(c)(c)$ ?

F.  $11c^7$   
G.  $24c^7$   
H.  $11c^{14}$   
J.  $24c^{14}$   
K.  $24 \cdot 7^c$

**DO YOUR FIGURING HERE.**

7. What is (are) the root(s) of the equation  $x^2 + 16 = 0$ ?

A. 2  
B.  $\pm 2$   
C. 4  
D.  $\pm 4$   
E.  $\pm 4i$

8. Pete is making a shirt out of cloth that costs \$5 per square foot. If he buys a rectangular piece of cloth that is 2 feet by 4 feet, how much does he have to pay?

F. \$5  
G. \$8  
H. \$20  
J. \$30  
K. \$40

9. Simplify  $x(x + 4) + (x + 2)(x - 1)$ .

A.  $8x - 2$   
B.  $2x^2 + 2$   
C.  $2x^2 + 5x - 2$   
D.  $5x^3$   
E.  $7x^3 - 2$



**ACT Practice Test 2 Section 1** *continued*

10. Which of the following is less than 0?

F.  $\left(-\frac{1}{4}\right)^2$

G.  $\left(\frac{1}{4}\right)^{-2}$

H.  $\left(-\frac{1}{4}\right)^{-1}$

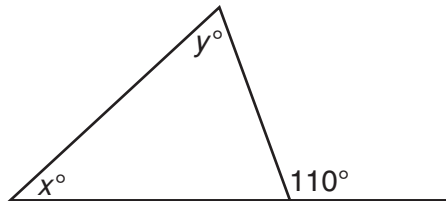
J.  $\left|-\frac{1}{4}\right|$

K.  $-(-\frac{1}{4})$

**DO YOUR FIGURING HERE.**

11. There are 50 marbles in a bag. Twenty of the marbles are blue, 14 are red, and the rest are green. What percent of the marbles are green?

- A. 16
- B. 28
- C. 32
- D. 40
- E. 50



12. What is the sum of  $x$  and  $y$  in degrees?

- F. 35
- G. 40
- H. 70
- J. 110
- K. 180

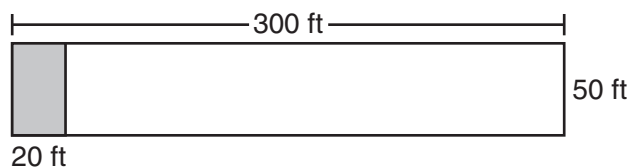
**GO ON** 

**ACT Practice Test 2 Section 1** *continued*

13. If  $4x + 3 = 2x + y$ , then  $2x =$

- A.  $y - 6$
- B.  $y - 3$
- C.  $y + 3$
- D.  $2y - 3$
- E.  $2y + 3$

**DO YOUR FIGURING HERE.**



14. Billy is mowing the lawn shown above. The shaded region is the area of the lawn that Billy was able to mow in 15 minutes. At this rate, what is the area of the lawn that Billy will be able to mow in one hour?

- F.  $1000 \text{ ft}^2$
- G.  $2000 \text{ ft}^2$
- H.  $3000 \text{ ft}^2$
- J.  $4000 \text{ ft}^2$
- K.  $5000 \text{ ft}^2$

15. What is the image of the point  $(3, -2)$  under the translation  $(x, y)$  to  $(x - 4, y - 1)$ ?

- A.  $(-1, -3)$
- B.  $(7, -1)$
- C.  $(1, 1)$
- D.  $(1, -1)$
- E.  $(7, 1)$

16. If  $x = 8$  and  $y = \frac{1}{4}$ , then  $-3x^2y^2 =$

- F.  $-36$
- G.  $-18$
- H.  $-12$
- J.  $18$
- K.  $36$



**ACT Practice Test 2 Section 1** *continued*

17. Which of the following statements best describe the relationship between the graphs of  $y = 2$  and  $y = 2x + 5$ ?
- A. The lines have the same slope.
  - B. The lines are perpendicular.
  - C. The lines intersect in exactly one point.
  - D. The lines intersect in more than one point.
  - E. None of the above.
18. If the diameter of a circle passes through the points  $(-2, 3)$  and  $(-5, 7)$ , what is the radius of the circle?
- F. 1.5
  - G. 2
  - H. 2.5
  - J. 4
  - K. 5
19. What is the product of the roots of the equation  $x^2 + 7x + 10 = 0$ ?
- A.  $-10$
  - B.  $-7$
  - C.  $\frac{2}{5}$
  - D. 7
  - E. 10
20.  $\left(\frac{1}{10}\right)^0 + \frac{1}{10} + \left(\frac{1}{10}\right)^2 + \left(\frac{1}{10}\right)^3 + \left(\frac{1}{10}\right)^4 =$
- F. 0.1010101
  - G. 0.1111
  - H. 1.01010101
  - J. 1.1111
  - K. 10.1010101

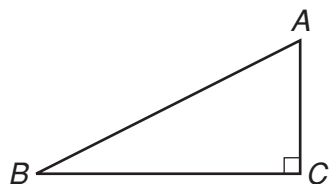
**DO YOUR FIGURING HERE.**

**ACT Practice Test 2 Section 1** *continued*

21. If  $h(x) = \sqrt{3x + 6}$  and  $m(x) = x^2 + 1$ , what is  $h(m(3))$ ?

**DO YOUR FIGURING HERE.**

- A. 6
- B. 7
- C. 8
- D. 9
- E. 10



22. If  $\tan A = \frac{5}{2}$ , which of the following could be the hypotenuse of triangle  $ABC$ ?

- F. 2
- G. 5
- H.  $\sqrt{29}$
- J. 7
- K. 10

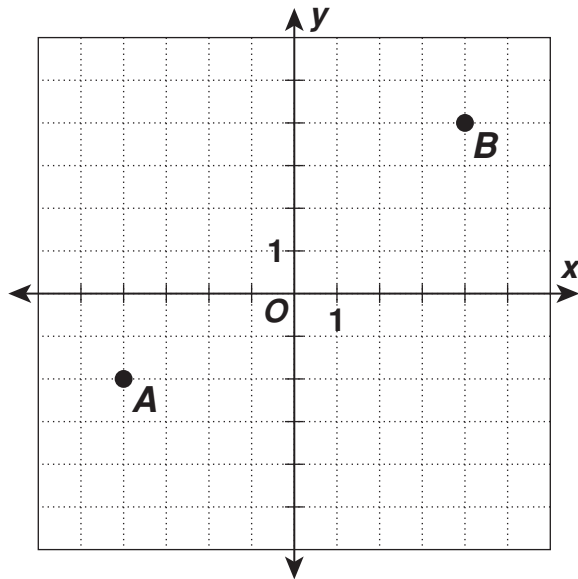
23. Thirty students took a test. There were 10 A's, 15 B's, and 5 C's. If Mary earned an A, what is the probability that Pete earned a C?

- A.  $\frac{1}{9}$
- B.  $\frac{1}{6}$
- C.  $\frac{5}{29}$
- D.  $\frac{1}{5}$
- E.  $\frac{5}{9}$



**ACT Practice Test 2 Section 1** *continued*

**DO YOUR FIGURING HERE.**



24. The midpoint between point *A* and point *B* on the coordinate grid is
- F. (0, 0)
  - G. (0, 1)
  - H. (-1, 0)
  - J. (-1, 1)
  - K. (1, 0)
25. Each number in a list is five less than the number before it. If the first number is 145, what is the 7<sup>th</sup> number?
- A. 100
  - B. 105
  - C. 110
  - D. 115
  - E. 120
26. Simplify  $\frac{(9.2 \times 10^5)(4.6 \times 10^7)}{2 \times 10^8}$ .
- F.  $2.116 \times 10^4$
  - G.  $6.9 \times 10^4$
  - H.  $2.116 \times 10^5$
  - J.  $2.116 \times 10^{20}$
  - K.  $6.9 \times 10^{27}$



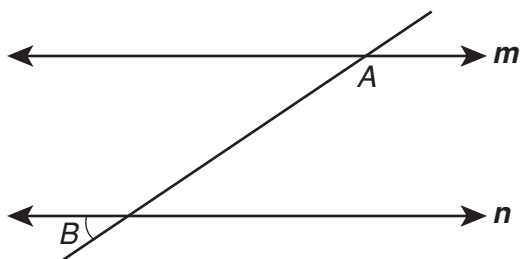


**ACT Practice Test 2 Section 1** *continued*

27. If  $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ , what is the value of  $b$ ?

**DO YOUR FIGURING HERE.**

- A. 6
- B. 8
- C. 10
- D. 12
- E. 14



28. If lines  $m$  and  $n$  above are parallel and the measure of angle  $A$  is  $110^\circ$ , what is the measure of angle  $B$  in degrees?

- F. 10
- G. 70
- H. 100
- J. 170
- K. 180

29. Which of the following is equal to  $\sqrt{80}$ ?

- A.  $4\sqrt{5}$
- B.  $5\sqrt{4}$
- C.  $16\sqrt{5}$
- D.  $5\sqrt{16}$
- E.  $2\sqrt{40}$



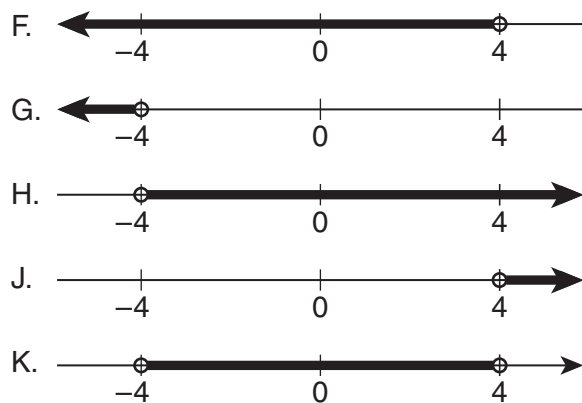
**ACT Practice Test 2 Section 1** *continued*

30. What is the area of a circle whose equation is  $(x - 3)^2 + (y + 1)^2 = 81$ ?

**DO YOUR FIGURING HERE.**

- F. 9
  - G. 18
  - H.  $9\pi$
  - J.  $18\pi$
  - K.  $81\pi$
31. If  $5x + 3y = 7$  and  $3x + 5y = 9$ , then  $2x - 2y = ?$
- A. -4
  - B. -2
  - C. 0
  - D. 2
  - E. 4

32. Which of the following is the graph of the solution set of  $x - 3 < 3x + 5$ ?



33. Which of the following is equivalent to  $(a^2b)^x$ ?

- A.  $a^{2+x}b^x$
- B.  $a^2b^x$
- C.  $a^{2+x}b^{1+x}$
- D.  $xa^2b$
- E.  $a^{2x}b^x$



**ACT Practice Test 2 Section 1** *continued*

34. When the point  $(4, -1)$  is reflected across the  $y$ -axis, what are the coordinates of its image?

F.  $(-4, -1)$   
G.  $(-4, 1)$   
H.  $(-1, 4)$   
J.  $(4, -1)$   
K.  $(4, 1)$

35. If  $(1, -2, 7)$  and  $(2, 4, 2)$  are points in 3D-space, what is the approximate distance between the two points?

A. 4  
B. 5  
C. 6  
D. 7  
E. 8

36. If  $a = 6$ , then  $\frac{\frac{a}{16}}{\frac{27}{a}} = ?$

F.  $\frac{1}{72}$   
G.  $\frac{1}{12}$   
H.  $\frac{16}{27}$   
J.  $\frac{27}{36}$   
K.  $\frac{27}{16}$

37. How many common factors do 24 and 36 have?

A. 1  
B. 2  
C. 4  
D. 6  
E. 8

**DO YOUR FIGURING HERE.**

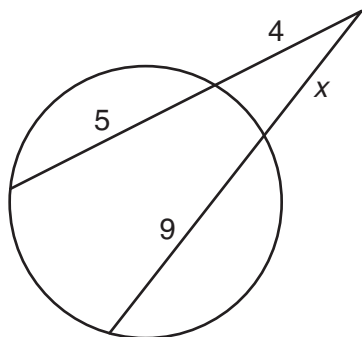


**ACT Practice Test 2 Section 1** *continued*

38. If  $x = 2\pi$ , then  $\cos(\pi + \frac{x}{4}) =$

- F. -1
- G.  $-\frac{1}{2}$
- H. 0
- J.  $\frac{1}{2}$
- K. 1

**DO YOUR FIGURING HERE.**



39. What is the value of  $x$  in the diagram above?

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

40. If  $x^2 + 5x - 14 > 0$ , then which of the following can NOT equal  $x$ ?

- F. -21
- G. -19
- H. 1
- J. 3
- K. 19

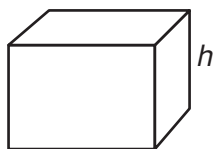


**ACT Practice Test 2 Section 1** *continued*

41. Jean has 4 jackets, 5 hats, and 3 pairs of boots. If she wears one of each whenever it gets cold, how many different outfits can she wear in the cold weather?

- A. 12
- B. 20
- C. 30
- D. 40
- E. 60

**DO YOUR FIGURING HERE.**



42. The solid above is a box and the length, width, and height are all integers. If the volume of the box is 32 cubic units, which of the following could NOT be the height?

- F. 2
- G. 4
- H. 6
- J. 8
- K. 16

43. Joe has a set of data to study. He adds one more data value to the set and as a result, the range increased. Which of the following statements **MUST** be true?

- A. The median also increased.
- B. The mean also increased.
- C. The mode also increased.
- D. The mean did not change.
- E. The mode did not change.

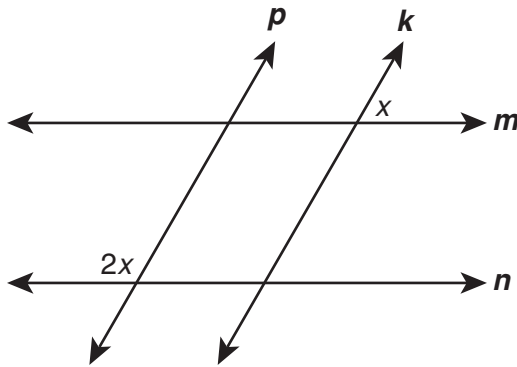


**ACT Practice Test 2 Section 1** *continued*

44. The minimum  $y$ -value of the graph of  $y = -2\sin x + 2$  is

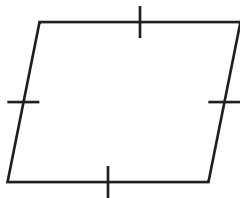
- F. -4
- G. -3
- H. -2
- J. -1
- K. 0

**DO YOUR FIGURING HERE.**



45. If lines  $m$  and  $n$  above are parallel and lines  $p$  and  $k$  are parallel, what is the value of  $x$  in degrees?

- A. 30
- B. 45
- C. 60
- D. 90
- E. 120



46. Which of the following statements about the polygon shown above is not ALWAYS true?

- F. The figure is a square.
- G. The figure is a rhombus.
- H. The figure is a parallelogram.
- J. The figure is a quadrilateral.
- K. The figure is two-dimensional.



**ACT Practice Test 2 Section 1** *continued*

47. Points  $a$ ,  $b$ , and  $c$  all lie on a number line. If the distance from  $b$  to  $c$  is 3, the distance from  $a$  to  $c$  is 5, and  $a$  is  $-1$ , then  $b$  could NOT be which of the following?

A.  $-9$   
B.  $-4$   
C.  $-3$   
D.  $1$   
E.  $7$

48. The value of Mrs. Jones' car decreases by 10% each year. If she paid \$18,000 for her car in 2000, how much was the car worth in 2003?

F. \$131  
G. \$180  
H. \$1312  
J. \$1800  
K. \$13,122

49. For the equation  $ax^2 + bx + c = 0$ , if  $b^2 - 4ac = 0$ , then the equation has

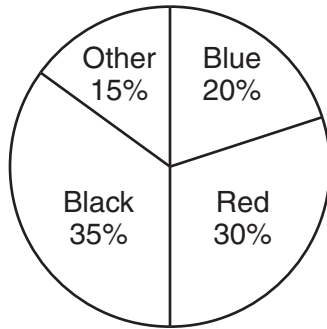
A. one real root  
B. two real roots  
C. one real root and one complex root  
D. two complex roots  
E. no roots

50. The measures of the angles of a triangle are in the ratio 6 : 9 : 10. What is the measure, in degrees, of the smallest angle?

F. 42.2  
G. 43.2  
H. 44.2  
J. 45.2  
K. 46.2

**DO YOUR FIGURING HERE.**



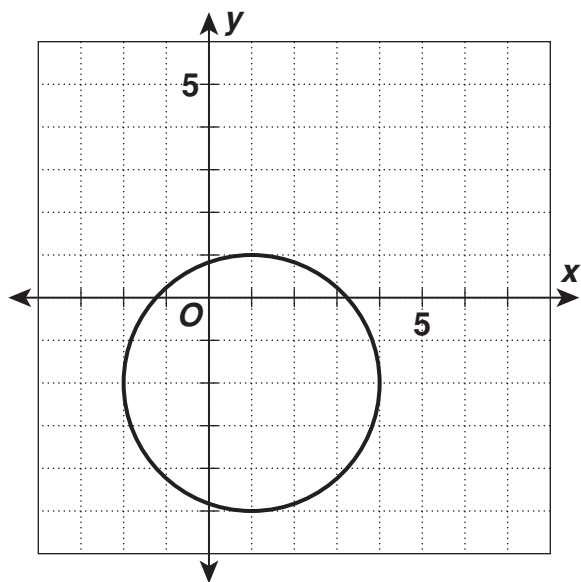
**ACT Practice Test 2 Section 1** *continued***Colors of Cars in the Parking Lot****DO YOUR FIGURING HERE.**

51. There are 200 cars in a parking lot. According to the data above, which of the following could NOT be the number of yellow cars?
- A. 0
  - B. 10
  - C. 20
  - D. 30
  - E. 40
52. If  $x^3 + 3x^2 \leq 0$ , then  $x$  can NOT be which of the following?
- F. -10
  - G. -5
  - H. -3
  - J. -1
  - K. 0
53. If  $x = -3$  and  $y = |2x + 4| - |6 - 3x|$ , then what does  $y$  equal?
- A. -13
  - B. -5
  - C. 5
  - D. 13
  - E. 17

**GO ON** 



**ACT Practice Test 2 Section 1** *continued*



**DO YOUR FIGURING HERE.**

**54.** Which of the following could be the equation of the conic graphed?

F.  $\frac{x^2}{3} + \frac{y^2}{3} = 1$

G.  $\frac{x^2}{9} + \frac{y^2}{9} = 1$

H.  $\frac{(x - 1)^2}{9} + \frac{(y + 2)^2}{9} = 1$

J.  $\frac{(x - 1)^2}{3} + \frac{(y + 2)^2}{3} = 1$

K.  $\frac{(x + 1)^2}{9} + \frac{(y - 2)^2}{9} = 1$

**55.** What is the product of the roots of the equation  $(4x - 5)(25x + 2) = 0$ ?

A. -10

B.  $-\frac{1}{10}$

C.  $\frac{-3}{100}$

D. 10

E.  $\frac{100}{3}$



**ACT Practice Test 2 Section 1** *continued*

56. Which of the following values of  $x$  satisfies the equation  $\sin(2x - 1) + 5 = 5$ ?

F. 0

G.  $\frac{1}{4}$

H.  $\frac{1}{2}$

J.  $\frac{\pi}{2}$

K.  $\pi$

**DO YOUR FIGURING HERE.**

57. If  $f(-2) = 5$ ,  $f(0) = 1$ , and  $f(2) = 5$ , which of the following is a valid representation of  $f(x)$ ?

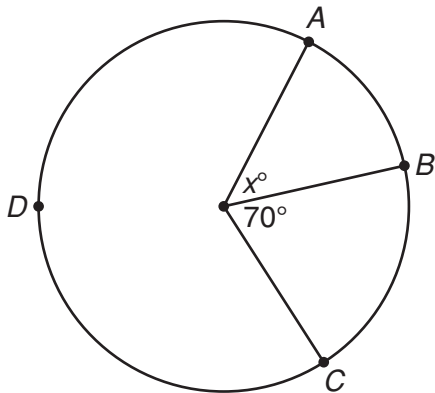
A.  $f(x) = -x + 1$

B.  $f(x) = x - 1$

C.  $f(x) = x + 1$

D.  $f(x) = x^2 - 1$

E.  $f(x) = x^2 + 1$



58. If the measure of  $\widehat{ADC}$  is twice the measure of  $\widehat{AC}$ , what is the value of  $x$  in degrees?

F. 30

G. 40

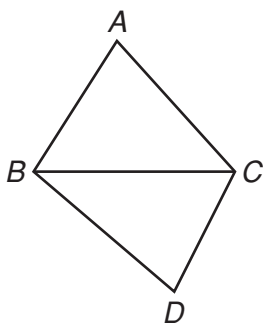
H. 50

J. 60

K. 70



**ACT Practice Test 2 Section 1** *continued*



**DO YOUR FIGURING HERE.**

**GIVEN:**  $AC = BD$  and  $\angle ACB \cong \angle DBC$

**PROVE:**  $\triangle ABC \cong \triangle DCB$

**59.** For the proof above, what would be the final justification?

- A. SSA
- B. SSS
- C. ASA
- D. SAS
- E. AAA

**60.** Simplify  $\frac{\frac{x}{3}}{\frac{x}{3} + \frac{3}{x}}$ .

- F.  $\frac{1}{2}$
- G.  $\frac{1}{3}$
- H.  $\frac{x}{3}$
- J.  $\frac{3}{x+3}$
- K.  $\frac{x^2}{x^2+9}$



If you finish before time is called, you may check your work on this section only. Do not turn to any other section in the test.