

This pretest contains questions that correspond to our 50 Skills. Take the test, and then check your answers with the answer key on page 11. The 50 Skills that follow contain more detailed solutions as well as instructions and drills for each type of question on the ACT.

DIRECTIONS: Solve each problem and choose the correct answer.
You are permitted to use a calculator on this test.

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

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

- 1 The lengths of the sides of a triangle are 3 consecutive even integers. If the perimeter of the triangle is 36 centimeters, what is the length, in centimeters, of the shortest side?

- (A) 7
- (B) 8
- (C) 10
- (D) 12
- (E) 14

- 2 If $2x + 3 = 8x - 5$, then $x = ?$

- (F) $\frac{4}{3}$
- (G) $\frac{3}{4}$
- (H) $\frac{1}{4}$
- (I) $-\frac{1}{4}$
- (K) -2



- 3 If $3x + 4y = 12$, what is y in terms of x ?

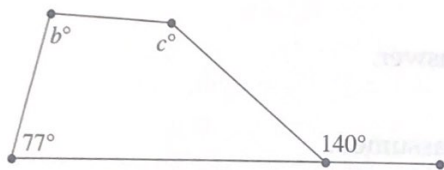
- (A) $3 - \frac{3}{4}x$
- (B) $3 + \frac{3}{4}x$
- (C) $4 - 3x$
- (D) $12 - 3x$
- (E) $x - 12$

- 4 So far, a student has earned the following scores on four 50-point quizzes during this marking period: 40, 37, 44, and 42. What score must the student earn on the fifth quiz to earn an average quiz score of 42 for the 5 quizzes?

- (F) 42
- (G) 45
- (H) 47
- (J) 49
- (K) The student cannot earn an average of 42.

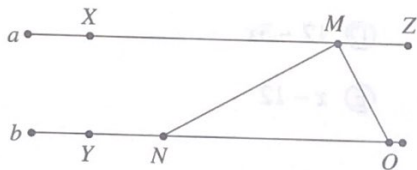
- 5 In the figure below, if $b = 100$, what is the value of c ?

- (A) 125
- (B) 130
- (C) 132
- (D) 143
- (E) 163



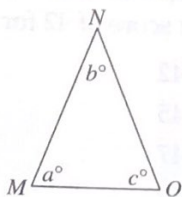
- 6 In the figure showing $\triangle MNO$ below, line a is parallel to line b . Which of the following angles must be congruent to $\angle ONM$?

- (F) $\angle NOM$
- (G) $\angle ZMO$
- (H) $\angle YNM$
- (J) $\angle OMN$
- (K) $\angle XMN$



- 7 If $MN = MO$ in the figure below, which of the following CANNOT be true?

- (A) $a \neq b$
- (B) $b \neq c$
- (C) $a = c$
- (D) $MN = NO$
- (E) $a \neq c$



- 8 For all x , $(2x - 5)(5x - 4) = ?$

- (F) $7x^2 + 20$
- (G) $10x^2 - 33x - 20$
- (H) $10x^2 - 33x + 20$
- (J) $7x^2 - 18x + 20$
- (K) $10x^2 - 18x - 20$

- 9 For all real numbers x , how many values of x are odd prime numbers less than 20?

- (A) 3
- (B) 5
- (C) 6
- (D) 7
- (E) 8

- 10 How many different, real number, prime factors does the number 120 have?

- (F) None
- (G) 2
- (H) 3
- (J) 8
- (K) 10

- 11 What is the least common multiple of 30, 40, and 50?

(A) 1200
(B) 800
(C) 600
(D) 400
(E) 50

- 12 What is the x intercept of the line that contains the points $(-2, 3)$ and $(4, 1)$ in the standard (x, y) coordinate plane?

(F) $(\frac{1}{2}, 0)$
(G) $(0, \frac{1}{2})$
(H) $(7, 0)$
(J) $(0, 7)$
(K) $(7, \frac{1}{2})$

- 13 If the slope of a line through the points $(-2, 5)$ and $(3, b)$ is -1 , what is the value of b ?

(A) -2
(B) -1
(C) 0
(D) 1
(E) 2

- 14 In the standard (x, y) coordinate plane, what is the slope of the line with equation $3x - 5y = -12$?

(F) $\frac{12}{5}$
(G) 2
(H) $\frac{3}{5}$
(J) $-\frac{3}{5}$
(K) -2

- 15 The following chart shows the results when 31 high school juniors were asked to write the name of their favorite movie on a slip of paper and place it in a box.

Movie	Votes
<i>Wedding Crashers</i>	4
<i>Across the Universe</i>	6
<i>Once</i>	2
<i>Lord of the Rings</i> trilogy	5
<i>Harry Potter</i> movies	6
<i>Superbad</i>	3
Other	5

If a slip of paper is chosen at random from the box, which of the following is closest to the percent chance that the slip chosen will name *Wedding Crashers*?

(A) 4%
(B) 13%
(C) 31%
(D) 35%
(E) 69%

16 If $f(x) = -2x^2 - 3$, what is $f(-3)$?

- (F) 33
- (G) 15
- (H) 3
- (J) -21
- (K) -39



17 A line in the standard (x, y) coordinate plane contains the points $P(3, -5)$ and $Q(-7, 9)$. What point is the midpoint of PQ ?

- (A) $(-2, 4)$
- (B) $(-2, -4)$
- (C) $(-2, 2)$
- (D) $(-2, -2)$
- (E) $(3, 3)$

18 If $c = -2b - 2(2e - b)$, what happens to the value of c when b and e are both increased by 2?

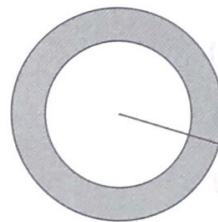
- (F) It is unchanged.
- (G) It is increased by 2.
- (H) It is increased by 4.
- (J) It is decreased by 2.
- (K) It is decreased by 8.

19 A square lot, with an area of 625 square feet, is completely fenced. What is the length, in feet, of the fence?

- (A) 25
- (B) 75
- (C) 100
- (D) 125
- (E) 300

20 In the diagram below, if the radius of the large circle is 6 and the radius of the small circle is 4, what is the area of the shaded region?

- (F) 2
- (G) 20
- (H) 2π
- (J) 20π
- (K) $\sqrt{20}$



21 A triangle with a perimeter of 89 has one side that is 19 inches long. The lengths of the other two sides have a ratio of 3:7. What is the length, in inches, of the *longest* side of the triangle?

- (A) 19
- (B) 21
- (C) 29
- (D) 40
- (E) 49

- 22 The number of students in three school clubs is shown in the following matrix.

Yoga	Spanish	Best Buddies
20	18	36

The school paper reported that the student body of the school was comprised according to the following ratios.

0.3 — Freshmen
0.5 — Sophomores & Juniors
0.2 — Seniors

Given these matrices, if participation in clubs is spread evenly among the grades, how many freshmen could be estimated to be in the Yoga Club?

- (F) 0.2
 (G) 0.3
 (H) 20
 (J) 10
 (K) 6
- 23 Points A , B , C , D , and E are points on a line in that order. If B is the midpoint of \overline{AC} , C is the midpoint of \overline{AD} , and D is the midpoint of \overline{AE} , which of the following is the longest segment?

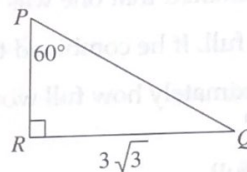
- (A) \overline{AB}
 (B) \overline{AD}
 (C) \overline{BC}
 (D) \overline{BD}
 (E) \overline{CE}

- 24 In a right triangle, the measures of two sides are 6 and 10; which of the following could be the measure of the third side?

- (F) 3
 (G) 4
 (H) 6
 (J) 8
 (K) 10

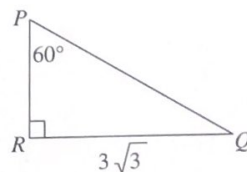
- 25 What is the shortest side of a triangle that is congruent to triangle PQR shown below?

- (A) 3
 (B) $3\sqrt{3}$
 (C) 6
 (D) $6\sqrt{3}$
 (E) 12



- 26 If triangle MNO (not shown) is similar to triangle PQR shown below, and has a shortest side with length 4.5, which of the following would be the measure of the longest side of triangle MNO ?

- (F) 4.5
 (G) 6.5
 (H) 9
 (J) 12
 (K) 15



27 If 5 percent of 20 percent of a number is 24 less than one-quarter of the number, what is the number?

- (A) 1
- (B) 5
- (C) 20
- (D) 50
- (E) 100

28 In Seth's refrigerator he found 2 jars of mustard.

He estimated that one was $\frac{1}{3}$ full and the other was $\frac{2}{5}$ full. If he combined the two jars into one, approximately how full would the one combined jar be?

- (F) $\frac{1}{3}$ full
- (G) $\frac{3}{5}$ full
- (H) $\frac{2}{3}$ full
- (J) $\frac{9}{10}$ full
- (K) Completely full

29 If $x^2 - y^2 = 84$ and $x - y = 6$, what is the value of $x + y$?

- (A) 6
- (B) 8
- (C) 10
- (D) 12
- (E) 14

30 Which of the following expressions is equivalent to $(-2x^2y^2)^3$?

- (F) $-2x^5y^5$
- (G) $-8x^6y^6$
- (H) $2x^5y^5$
- (J) $8x^5y^5$
- (K) $8x^6y^6$

31 If $8m^2p^3 = m^5p$, what is m in terms of p ?

- (A) $p^{2/3}$
- (B) $2p^{2/3}$
- (C) $8p^{2/3}$
- (D) $2p^2$
- (E) $8p^2$

- 32 If Sawyer charges \$20 per bottle of water and a flat fee of \$25 even to discuss a sale, which of the following equations expresses Sawyer's total fees for x bottles of water?

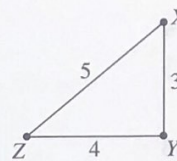
- (F) $y = 45x$
- (G) $y = 25x + 20$
- (H) $y = 5x$
- (J) $y = 20x + 25$
- (K) $y = 45x$

- 33 Arthur Dent buys an ice cream sundae that contains one scoop of ice cream, one sauce, and either a cherry or pineapple wedge on top. He can choose chocolate, vanilla, strawberry, or banana ice cream; he can choose chocolate, caramel, or berry sauce; and he can choose either the cherry or the pineapple wedge for the top. How many different arrangements of these ingredients for Arthur's ice cream sundae are possible?

- (A) 9
- (B) 14
- (C) 24
- (D) 44
- (E) 64

- 34 For right triangle $\triangle XYZ$, shown below, what is $\tan Z$?

- (F) 0.2
- (G) 0.6
- (H) 0.75
- (J) 0.8
- (K) 0.9



- 35 What is the value of θ , between 0 and 360, when $\sin \theta = -1$?

- (A) 0
- (B) 60
- (C) 135
- (D) 270
- (E) 330

- 36 Of the 18 socks in a drawer, 10 are solid blue, 4 are solid pink, and 4 are pink and blue. If Cherng-Mao randomly chooses a sock from the drawer, what is the probability that it will NOT be solid pink?

- (F) $\frac{1}{6}$
- (G) $\frac{2}{9}$
- (H) $\frac{4}{9}$
- (J) $\frac{5}{9}$
- (K) $\frac{7}{9}$

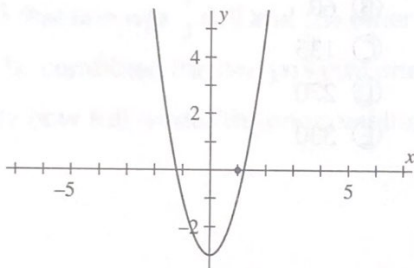
37 What are the values for x that satisfy the equation $(x + 4)(x - 3) = 0$?

- (A) -4 and 4
- (B) -3 and 3
- (C) -12
- (D) 4 and -3
- (E) -4 and 3

38 If the graph of $y = ax^2 + bx + c$ is shown below, then the value of ac can be

- I. Positive
- II. Negative
- III. 0

- (F) I only
- (G) II only
- (H) I or II
- (J) I or III
- (K) I, II, or III

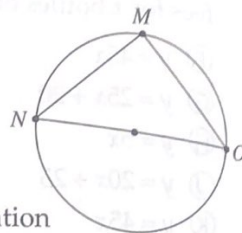


39 A circle in the standard (x, y) coordinate plane has center $(4, 2)$ and radius of 5 coordinate units. Which of the following is an equation of the circle?

- (A) $(x - 4)^2 - (y - 2)^2 = 5$
- (B) $(x + 4)^2 + (y + 2)^2 = 5$
- (C) $(x - 4)^2 + (y - 2)^2 = 5$
- (D) $(x - 4)^2 - (y + 2)^2 = 25$
- (E) $(x - 4)^2 + (y - 2)^2 = 25$

40 In the figure below, segment NO is a diameter of the circle, M is a point on the circle, and $MN = MO$. What is the degree measure of $\angle MNO$?

- (F) 30
- (G) 45
- (H) 60
- (J) 90
- (K) Cannot be determined from the given information



41 Which of the following are solutions to $|n + 3| = 5$?

- I. 2
 - II. -2
 - III. -8
- (A) I only
 - (B) III only
 - (C) II and III
 - (D) I and III
 - (E) I, II, and III

42 Which of the following statements is NOT true about the arithmetic sequence $20, 13, 6, -1, \dots$?

- (F) The fifth term is -8.
- (G) The sum of the first five terms is 30.
- (H) The seventh term is -22.
- (J) The common difference of terms is -7.
- (K) The common ratio of consecutive terms is -7.

- 43 The temperature 357°F is the point at which mercury will boil. Since Fahrenheit and Celsius temperatures are related by the formula $F = \frac{9}{5}C + 32$, to the nearest degree, which of the following is the boiling point of mercury in degrees Celsius?

(A) 11°C
(B) 87°C
(C) 112°C
(D) 166°C
(E) 181°C

- 44 If $f(x) = 3x^2$, which of the following expresses $f(2p)$?

(F) $6p$
(G) $6p^2$
(H) $12p$
(J) $12p^2$
(K) $24p^3$

- 45 If a board 9 feet 10 inches long is cut in half, how long is each new piece?

(A) $4' 9''$
(B) $4' 11''$
(C) $5'$
(D) $5' 2''$
(E) $5' 5''$

- 46 Suppose $0 < b < 1$. Which of the following has the greatest value?

(F) b^2
(G) b^3
(H) $\log b$
(J) $|b|$
(K) b^{-1}

- 47 What is the real value of x in the equation $\log_2 16 = \log_4 x$?

(A) 2
(B) 32
(C) 64
(D) 128
(E) 256

- 48 What is $(i - 2)(i - 3)$?

(F) $5 - 5i$
(G) $5 - 4i$
(H) $5 + i$
(J) 5
(K) -1

- 49 The table below shows the results of a survey in which 180 high school students voted for their favorite movie. Each student received one vote. According to the graph, how many more students favored *Superbad* than *Wedding Crashers*?

Movie	Votes	♥ = 20 votes
<i>Superbad</i>	♥ ♥ ♥ ♥ ♥	
<i>The Dark Knight</i>	♥ ♥	
<i>Wedding Crashers</i>	♥ ♥	
<i>Godfather</i>	♥	

- (A) 3
 (B) 3.5
 (C) 35
 (D) 70
 (E) 79.5

- 50 Javier earned the following 7 test scores. What is the median?

85, 92, 82, 94, 90, 80, 79

- (F) 80
 (G) 82
 (H) 85
 (J) 86
 (K) 90