

ACT Practice Paper
ACT MATH Practice Paper 2

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 this 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.

Note: 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.

SET ONE

1. What is the degree measure of the acute angle formed by the hands of a 12-hour clock that reads exactly 1 o'clock?

- A. 15°
- B. 30°
- C. 45°
- D. 60°
- E. 72°

2.

What is the probability that a number selected at random from the set $\{2, 3, 7, 12, 15, 22, 72, 108\}$ will be divisible by both 2 and 3 ?

- A. $\frac{1}{4}$
- B. $\frac{3}{8}$
- C. $\frac{3}{5}$
- D. $\frac{5}{8}$
- E. $\frac{7}{8}$

3. A circle has a circumference of 16 feet. What is the radius of the circle, in feet?

- A. $\sqrt{8}$
- B. 4
- C. 8
- D. 16
- E. 32

4. A rectangle with a perimeter of 30 centimeters is twice as long as it is wide. What is the area of the rectangle in square centimeters?

- A. 15
- B. 50
- C. 200
- D. 3
- E. 6

5. In the standard (x,y)coordinate plane, what are the coordinates of the midpoint of a line segment whose endpoints are $(-3,0)$ and $(7,4)$?

- A. (2,2)
- B. (2,4)
- C. (5,2)
- D. (5,4)
- E. (5,5)

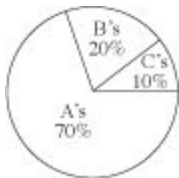
6. Points A, B, C, and D are on a line such that B is between A and C, and C is between B and D. The distance from A to B is 6 units. The distance from B to C is twice the distance from A to B, and the distance from C to D is twice the distance from B to C. What is the distance, in units, from the midpoint of to the midpoint of ?

- A. 18
- B. 14
- C. 12
- D. 9
- E. 6

7. Which of the following statements must be true whenever n , a , b , and c are positive integers such that $n < a$, $c > a$, and $b > c$?

- A. $a < n$
- B. $b - n > a - n$
- C. $b < n$
- D. $n + b = a + c$
- E. $2n > a + b$

8. The distribution of Jamal's high school grades by percentage of course credits is given in the circle graph below. What is Jamal's grade point average if each A is worth 4 points; each B, 3 points; and each C, 2 points?



- A. 3.0
- B. 3.4
- C. 3.6

D. 3.7

E. Cannot be determined from the given information

9. What is the difference between 1.8 and 1.08?

(Note: A bar indicates a digit pattern that is repeated.)

A. $0.\overline{71}$

B. $0.\overline{71}$

C. $0.\overline{719}$

D. $0.\overline{72}$

E. $0.\overline{72}$

10. Which of the following equations represents the linear relationship between time, t , and velocity, v , shown in the table below?

| | | | |
|-----|-----|-----|-----|
| t | 0 | 1 | 2 |
| v | 120 | 152 | 184 |

| | | | |
|-----|-----|-----|-----|
| t | 0 | 1 | 2 |
| v | 120 | 152 | 184 |

A. $v = 32t$

B. $v = 32t + 120$

C. $v = 120t$

D. $v = 120t + 32$

E. $v = 120t + 120$

11. An industrial cleaner is manufactured using only the 3 secret ingredients A, B, and C, which are mixed in the ratio of 2:3:5, respectively, by weight. How many pounds of secret ingredient B are in a 42-pound (net weight) bucket of this cleaner?

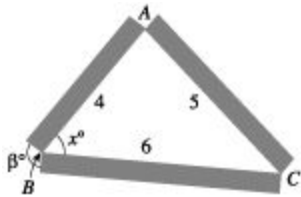
- A. 4.2
- B. 12.6
- C. 14.0
- D. 18.0
- E. 21.0

12. If $n = 8$ and $16 \cdot 2m = 4n - 8$, then $m = ?$

- A. -4
- B. -2
- C. 0
- D. 1
- E. 8

SET TWO

1. In the figure below, A, B, C, and D are collinear, FC is parallel to ED, BE is perpendicular to ED, and the measures of $\angle FAB$ and $\angle EBA$ are as marked. What is the measure of $\angle FCB$?

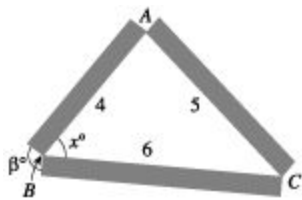


- A. 33°
- B. 57°
- C. 63°
- D. 84°
- E. Cannot be determined from the given information

2. Which of the following is an equation of the circle with its center at (0,0) that passes through (3,4) in the standard (x,y) coordinate plane?

- A. $x - y = 1$
- B. $x - y = 25$
- C. $x^2 + y = 25$
- D. $x^2 + y^2 = 5$
- E. $x^2 + y^2 = 25$

Use the following information to answer questions 3–5. Taher has decided to create a triangular flower bed border. He plans to use 3 pieces of rectangular lumber with lengths 4, 5, and 6 feet, as shown in the figure below. Points A, B, and C are located at the corners of the flower bed.



3. Taher plans to cut the 3 pieces of lumber for the flower bed border from a single piece of lumber. Each cut takes $\frac{1}{8}$ inch of wood off the length of the piece of lumber. Among the following lengths, in inches, of pieces of lumber, which is the shortest piece that he can use to cut the pieces for the flower bed border?

- A. 178
- B. 179
- C. 180
- D. 181
- E. 182

4. The measure of $\angle ABC$ in the figure is x° . Which of the following is an expression for β° ?

- A. x°
- B. $2x^\circ$
- C. $(90 + x)^\circ$
- D. $(180 - x)^\circ$
- E. $(180 - x/2)^\circ$

5. After arranging the flower bed, Taher decides that the flower bed would look more attractive if 1 of the angles in the triangle were a right angle. He decides to place the right angle at vertex A and to leave the lengths of AB and AC as 4 and 5 feet, respectively. To the nearest 0.1 foot, how long of a piece of lumber would he need to replace the 6-foot piece represented by BC ?

- A. 3.0
- B. 3.3
- C. 6.0
- D. 6.4
- E. 7.8

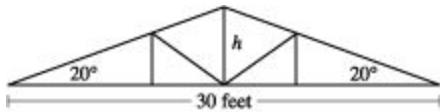
6. Which one of the following expressions has an even integer value for all integers a and c ?

- A. $8a + 2ac$
- B. $3a + 3c$
- C. $2a + c$
- D. $a + 2c$
- E. $ac + a^2$

7. A neighborhood recreation program serves a total of 280 children who are either 11 years old or 12 years old. The sum of the children's ages is 3,238 years. How many 11-year-old children does the recreation program serve?

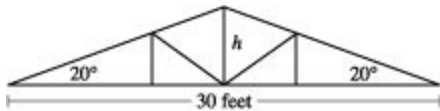
- A. 55
- B. 122
- C. 132
- D. 158
- E. 208

8. The geometric figure shown below consists of a square and 4 semicircles. The diameters of the semicircles are the sides of the square, and each diameter is 10 centimeters long. Which of the following is the closest approximation of the total area, in square centimeters, of this geometric figure?



- A. 100
- B. 160
- C. 260
- D. 400
- E. 730

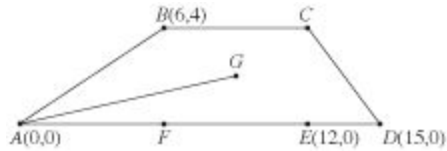
9. Which of the following expressions is the closest approximation to the height h , in feet, of the roof truss shown below?



- A. $15 \tan 20^\circ$
- B. $15 \sin 20^\circ$
- C. $30 \tan 20^\circ$
- D. $30 \sin 20^\circ$

E. $\frac{15}{\sin 20^\circ}$

10. Quadrilateral ABCD is drawn on the standard (x,y) coordinate plane as shown below, with points E and F on AD. Point G is the center of rectangle BCEF. How many coordinate units long is AG ?



- A. $\sqrt{10}$
- B. $\sqrt{13}$
- C. $\sqrt{85}$
- D. $\sqrt{97}$
- E. 11

11. What is the x-intercept of the graph of $y = x^2 - 4x + 4$?

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

12. For all nonzero real numbers p, t, x, and y such that $\frac{x}{y} = \frac{3p}{2t}$, which of the following expressions is equivalent to t ?

- A. $y/2$
- B. $3px/2y$
- C. $6py/x$
- D. $3py/x$
- E. $3py/2x$