Practice Test Questions

ENGLISH
MATH
READING
SCIENCE
WRITING

Math

Test Tips

An actual ACT Mathematics Test contains 60 questions to be answered in 60 minutes.

- Read each question carefully to make sure you understand the type of answer required.
- If you choose to use a calculator, be sure it is permitted, is working on test day, and has reliable batteries.
- Use your calculator wisely.
- Solve the problem.
- Locate your solution among the answer choices.
- Make sure you answer the question asked.
- Make sure your answer is reasonable.
- Check your work.

Calculator Tips

- Review the latest information on permitted and prohibited calculators.
- You are not required to use a calculator. All the problems can be solved without a calculator.
- If you regularly use a calculator in your mathematics work, use one you're familiar with when you take the mathematics test. Using a more powerful, but unfamiliar, calculator is not likely to give you an advantage over using the kind you normally use.

Click on letter choices below to view the correct answer and explanations.

MATH

SET THREE

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.

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°

CORRECT RESPONSE ^

Correct! You are correct. One complete rotation of a clock hand is 360°, and there are 12 hourly markings on a clock. When the hands read exactly 1 o'clock, the degree measure of the angle formed by the clock hands is $\frac{1}{12}$ of a complete rotation, or $\frac{1}{12}$ (360°) = 30°.

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 ?

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

G. $\frac{3}{8}$

H. $\frac{3}{5}$

I. $\frac{5}{8}$

J. $\frac{7}{8}$

CORRECT RESPONSE ^

Correct! The correct response is G. Since 12, 72, and 108 are the only numbers in the list divisible by both 2 and 3, the probability that the number selected at random is divisible by both 2 and 3 is ⅜

3.

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

A. $\sqrt{8}$

B. 4

C. 8

D. 16

E. 32

CORRECT RESPONSE

Correct! 8 is the correct answer. The formula for the circumference of a circle with radius r is $2\pi r$. So $2\pi r = 16$, or $r = 8$.

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?

F. 15

G. 50

H. 200

I. $3\sqrt{15}$

J. $6\sqrt{15}$

CORRECT RESPONSE

Correct! This is the correct answer. If w = width, then $2w$ = length. So, the perimeter is $2(w + 2w) = 30$, and $w = 5$. Since the width is 5, the length is $2(5) = 10$. Then the area is $5(10) = 50$.

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)

CORRECT RESPONSE

Correct! (2,2) is the correct answer. To find the midpoint, you need to take the average of each of the coordinates, $\left(\frac{-3+7}{2}, \frac{0+4}{2}\right)$ = (2,2).

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 $\overline{BC}$ to the midpoint of $\overline{CD}$?

F. 18

G. 14

H. 12

I. 9

J. 6

CORRECT RESPONSE

Correct! This is the correct response. $BC = 2AB = 2(6) = 12$ and $CD = 2BC = 2(12) = 24$. The distance between the midpoints of $\overline{BC}$ and $\overline{CD}$ is $\frac{1}{2}BC + \frac{1}{2}CD = \frac{1}{2}(12) + \frac{1}{2}(24) = 18$

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. $2n > a + b$

CORRECT RESPONSE

Correct! The correct response is B. Since $b > a$, subtracting n from each side, $b - n > a - n$, will not change the relationship between b and a.

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?

F. 3.0

G. 3.4

H. 3.6

I. 3.7

J. Cannot be determined from the given information

CORRECT RESPONSE

Correct! This is the correct answer since 4(0.7) + 3(0.2) + 2(0.1) = 3.6.

9.

What is the difference between 1.8 and $1.\overline{08}$?

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

A. $0.7\overline{1}$

B. $0.\overline{71}$

C. $0.7\overline{19}$

D. $0.7\overline{2}$

E. $0.\overline{72}$

CORRECT RESPONSE

Correct. The correct response is $0.7\overline{19}$. Take $1.\overline{08}$ and repeat the pattern several times, then subtract that from 1.8. 1.8 – 1.08080808 ≈ 0.7191919. Realizing that the pattern should repeat, you can conclude that $0.7\overline{19}$ is the correct answer.

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

F. $v = 32t$

G. $v = 32t + 120$

H. $v = 120t$

I. $v = 120t + 32$

J. $v = 120t + 120$

CORRECT RESPONSE ^

Correct! This is the correct answer. A linear relationship means the associated graph is a line. So, you can think of the ordered pairs (t,v) as points on the line. Since (0,120), (1,152), and (2,184) are points on the line, the slope of the line is $\frac{152-120}{1-0} = 32$. Therefore, $v = 32t + b$, where b is the y-intercept of the line. Since (0,120) is a point on the line, $120 = 32(0) + b$, or $b = 120$. Thus, an equation for the line is $v = 32t + 120$.

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

CORRECT RESPONSE ^

Correct! The correct answer is B. If you let $3x$ be amount of secret ingredient B, you can set up the equation $2x + 3x + 5x = 42$. Since $10x = 42$, $x = 4.2$, and $B = 3x = 12.6$.

12.

If $n = 8$ and $16 \cdot 2^m = 4^{n-8}$, then $m = ?$

F. −4

G. −2

H. 0

I. 1

J. 8

CORRECT RESPONSE ^

Correct! The correct answer is F. When $n = 8$, $4^{n-8} = 4^{8-8} = 4^0 = 1$, and $16 \cdot 2^m = 2^4 \cdot 2^m = 2^{4+m}$. So, $2^{4+m} = 1$, and any number to the zeroth power is 1, so $4 + m = 0$, or $m = -4$.

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