SECTION 3: QUANTITATIVE REASONING

35 minutes • 20 questions

(The paper-and-pencil version will have 25 questions to be completed in 40 minutes.)

For each question, follow the specific directions and choose the best answer.

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>
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>
> - All figures are assumed to lie in a plane unless otherwise indicated.
>
> - Geometric figures, such as lines, circles, triangles, and quadrilaterals, *are not necessarily* drawn to scale. That is, you should *not* assume that quantities such as lengths and angle measures are as they appear in a figure. You should assume, however, that lines shown as straight are actually straight, points on a line are in the order shown, and more generally, all geometric objects are in the relative positions shown. For questions with geometric figures, you should base your answers on geometric reasoning, not on estimating or comparing quantities by sight or by measurement.
>
> - Coordinate systems, such as *xy*-planes and number lines, *are* drawn to scale. Therefore, you can read, estimate, or compare quantities in such figures by sight or by measurement.
>
> - Graphical data presentations, such as bar graphs, circle graphs, and line graphs, *are* drawn to scale. Therefore, you can read, estimate, or compare data values by sight or by measurement.

FOR QUESTIONS 1–10, COMPARE QUANTITY A AND QUANTITY B. SOME QUESTIONS WILL HAVE ADDITIONAL INFORMATION ABOVE THE TWO QUANTITIES TO USE IN DETERMINING YOUR ANSWER.
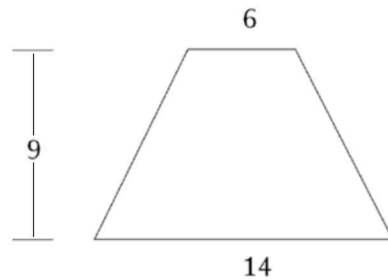

$$\frac{5}{8}x = \frac{1}{12}$$

1.   <u>Quantity A</u>   <u>Quantity B</u>

                        x $\dfrac{2}{15}$

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

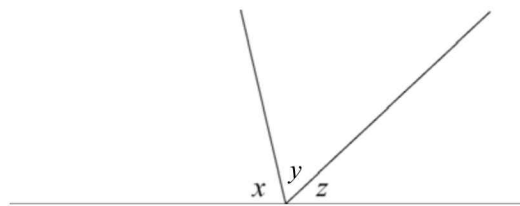(D) The relationship cannot be determined from the information given.

2.

Quantity A	Quantity B
$\dfrac{0.00008}{0.00006}$	0.75

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

3.

Quantity A	Quantity B
The area of the trapezoid	80

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

4.

Quantity A	Quantity B
The mean of angles x, y, z	60

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

5.
	Quantity A	Quantity B

Quantity A: $\sqrt{(66)(27)}$ Quantity B: $(8)(4.9)$

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

(D) The relationship cannot be determined from the information given.

$$xy = 3.2$$

6.
Quantity A   Quantity B

$1.5x(4.6y)$ 22.08

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

(D) The relationship cannot be determined from the information given.

7.
Quantity A   **Quantity B**

Time it takes a bicycle to travel   Time it takes a car to travel
15 miles   60 miles

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

(D) The relationship cannot be determined from the information given.

An apple costs \$0.25. An orange costs \$0.35. A pear costs $\frac{1}{2}$ of the sum of an apple and an orange.
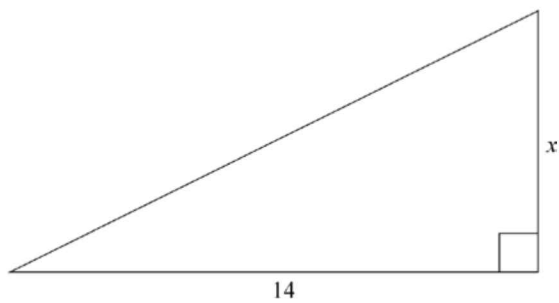
8.

Quantity A	Quantity B
5 apples and 5 oranges	12 pears

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

(D) The relationship cannot be determined from the information given.

There were x iPads in the Apple store. After $\frac{1}{10}$ of them were sold, 6 more were brought into the store, giving them 51 in stock.

9.

Quantity A	Quantity B
x	54

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

(D) The relationship cannot be determined from the information given.

the area of the triangle is 70

10.   <u>Quantity A</u>   <u>Quantity B</u>
                              x 10

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

(D) The relationship cannot be determined from the information given.

Questions 11–20 have several formats. Unless the directions state otherwise, choose one answer choice. For Numeric Entry questions, follow the instructions below.

Numeric Entry Questions

The following items are the same for both the computer-based version of the test and the paper-and-pencil version. However, those taking the computer-based version will have additional information about entering answers in decimal and fraction boxes on the computer screen. Those taking the paper-and-pencil version will have information about entering answers on answer grids.

- Your answer may be an integer, a decimal, or a fraction, and it may be negative.
- If a question asks for a fraction, there will be two boxes. One box will be for the numerator and one will be for the denominator.
- Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct.
- Enter the exact answer unless the question asks you to round your answers.

QUESTIONS 11–13 REFER TO THE GRAPH BELOW.

Pollutants Entering the Ocean
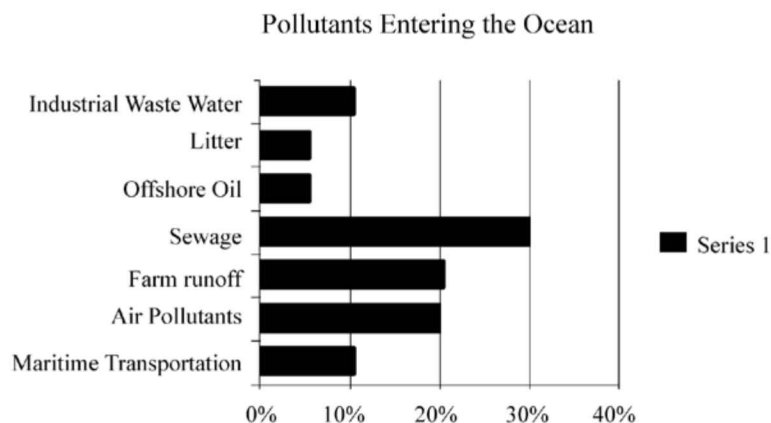
11. What is the percentage of offshore oil compared to all pollutants?

(A) 5%

(B) 10%

(C) 15%

(D) 20%

(E) 30%

12. Sewage, litter, and air pollution make up what percentage of the whole?

(A) 5%

(B) 15%

(C) 30%

(D) 45%

(E) 55%

13. If air pollution is eliminated from the graph, what percentage would sewage be of the new graph "Water-Born Pollutants Entering the Ocean"?

(A) 24%

(B) 28%

(C) 37.5%

(D) 40%

(E) 44.5%

14. A receptionist greeted the following numbers of people during one work week: 4, 19, 21, 18, 23. What is the mean of the number of people she greeted?

(A) 17

(B) 19

(C) 20

(D) 21

(E) 85

15. A farmer owns a square property and wants to sell a lot formed by dividing the lot in half, both lengthwise and widthwise. If the resulting lot has a perimeter of 888,000 feet, what is the area of the original lot?

(A) 179,936,000,000 sq. ft.

(B) 185,926,000,000 sq. ft.

(C) 197,136,000,000 sq. ft.

(D) 200,000,000,000 sq. ft.

(E) 212,386,000,000 sq. ft.

**FOR QUESTION 16, CHOOSE THE <u>TWO</u> ANSWERS THAT APPLY.**

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16. What are the two factors of $x^2 + 9x + 18$?

(A) $x + 3$

(B) $x - 3$

(C) $x + 2$

(D) $x - 2$

(E) $x + 9$

(F) $x - 9$

(G) $x + 6$

(H) $x - 6$

> **FOR QUESTION 17, INDICATE <u>ALL</u> THE ANSWERS THAT APPLY.**

17. The local baseball team employs at least 3 times as many pitchers as catchers, but never more than 11 players total. Pitchers make an average of $45,000, and catchers make an average of $30,000. Which of the following amounts are the possible averages for all the pitchers and catchers, rounded to the nearest dollar?

    (A) 30,000

    (B) 35,899

    (C) 40,375

    (D) 41,250

    (E) 41,956

    (F) 42,273

    (G) 43,743

    (H) 45,000

> **FOR QUESTIONS 18–19, ENTER YOUR ANSWERS IN THE BOXES.**

18. $\dfrac{\left(\left(2^3\right)^2\right)^2}{\left(2^2\right)^3} =$

    $$\boxed{}$$
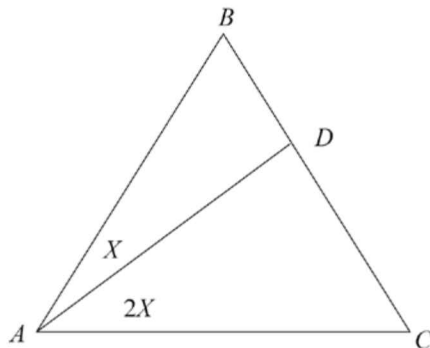
19. If ABC is an equilateral triangle, what is the measure of angle BAD?

    $$\boxed{}$$

FOR QUESTION 20, INDICATE **ALL** THE ANSWERS THAT APPLY.

20. Which of the following numbers have factors of 2, 5, 6?

    (A) 60
    (B) 84
    (C) 95
    (D) 110
    (E) 125
    (F) 166
    (G) 247
    (H) 300

STOP

If you finish before the time is up, you may check your work in this section only.

SECTION 4: QUANTITATIVE REASONING

35 minutes • 20 questions

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- Graphical data presentations, such as bar graphs, circle graphs, and line graphs, *are* drawn to scale. Therefore, you can read, estimate, or compare data values by sight or by measurement.

FOR QUESTIONS 1–8, COMPARE QUANTITY A AND QUANTITY B. SOME QUESTIONS WILL HAVE ADDITIONAL INFORMATION ABOVE THE TWO QUANTITIES TO USE IN DETERMINING YOUR ANSWER.

1.

Quantity A	Quantity B
$\dfrac{5}{\left(\dfrac{1}{5}\right)^2}$	125

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

(D) The relationship cannot be determined from the information given.

2.   <u>Quantity A</u>   <u>Quantity B</u>

$$\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}$$ 1

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
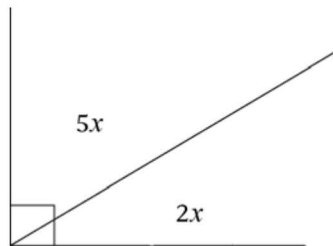(D) The relationship cannot be determined from the information given.

$$y \neq 0$$

3.   <u>Quantity A</u>   <u>Quantity B</u>

$$\frac{5}{y}$$ $5y$

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

$$a > b > 0 > c > d$$

4.   <u>Quantity A</u>   <u>Quantity B</u>

$$a + d$$ $b + c$

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

$$x > 0$$

5.   <u>Quantity A</u>   <u>Quantity B</u>

$$x^3 (x - 1)$$ $x^4 + x^3$

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

6. 　　　　Quantity A　　　　　　　　Quantity B
　　　　　　　x　　　　　　　　　　　　15

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

$$x \neq 0$$

7. 　　　　Quantity A　　　　　　　　Quantity B

　　　　　$x^{-3}(x^3)$　　　　　　　$\dfrac{1}{x^{-3}(x^3)}$

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Sam is 3 times as old as Sue. In 5 years Sam will be 12 years older than twice Sue's age.

8. 　　　　Quantity A　　　　　　　　Quantity B
　　　　　Sue's age　　　　　　　　　　22

(A) Quantity A is greater.
(B) Quantity B is greater.
(C) The two quantities are equal.
(D) The relationship cannot be determined from the information given.

Questions 9–20 have several formats. Unless the directions state otherwise, choose one answer choice. For Numeric Entry questions, follow the instructions below.

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- Equivalent forms of the correct answer, such as 2.5 and 2.50, are all correct.

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QUESTIONS 9–11 REFER TO THE BAR GRAPH BELOW.

Average Daily Use Per Salesperson
(rounded to the nearest dollar)
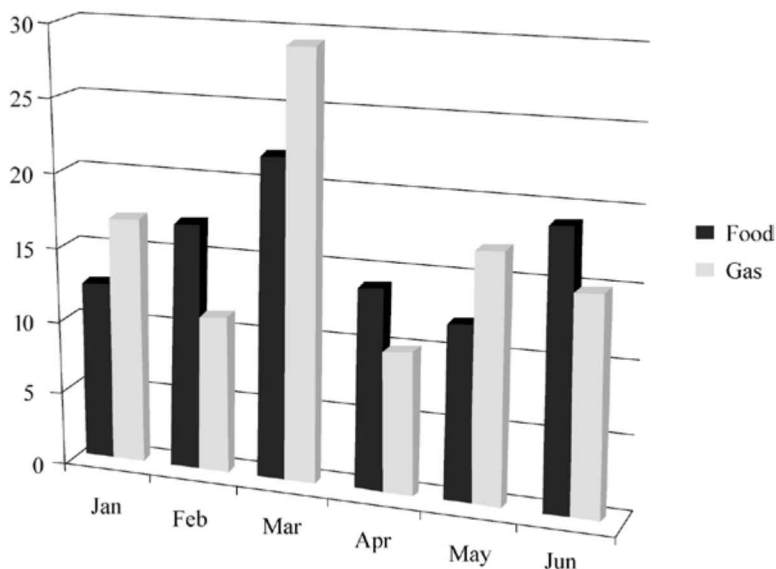

9. If there are 33 salespeople in the company, what was the approximate total spent on food and gas for January?
   (A) $24,765
   (B) $25,575
   (C) $29,865
   (D) $35,805
   (E) $36,905

10. In February, the company had an outlay of $21,056 for food. How many salespeople did the company employ for the month?

(A) 28

(B) 47

(C) 56

(D) 73

(E) 75

11. The projections for the coming year indicate an increase of 10 percent in the average cost of gas. How much more per day will the company pay out on average for gas for the first 6 months of next year?

(A) $9

(B) $12

(C) $15

(D) $18

(E) $21

12. The frame shop has a rectangular mat 36" by 22". If a mat is cut from it that is 2" less all the way around, what is the area of the new mat?

(A) 576

(B) 680

(C) 648

(D) 792

(E) 822
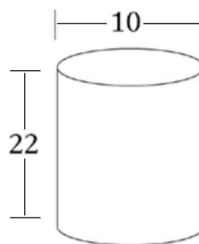
13. What is the volume of the given cylinder?

(A) 345.5

(B) 690.8

(C) 1727

(D) 3799.4

(E) 6908
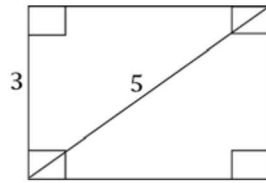
14. Find the perimeter of the figure.

   (A) 7
   (B) 8
   (C) 14
   (D) 16
   (E) 30

15. The original price of a shirt was $40. It was marked down twice before it was sold. First it was marked down 20%, and then it was marked down 15% of its discounted price. What percentage of the original price did it sell for?

   (A) 68%
   (B) 48%
   (C) 32%
   (D) 85%
   (E) 80%

16. What is the mean salary of 5 potters when two make $15.50 per hour, one makes $12 per hour, and the other two make $13.50 per hour?

   (A) $10
   (B) $12
   (C) $14
   (D) $16
   (E) $17

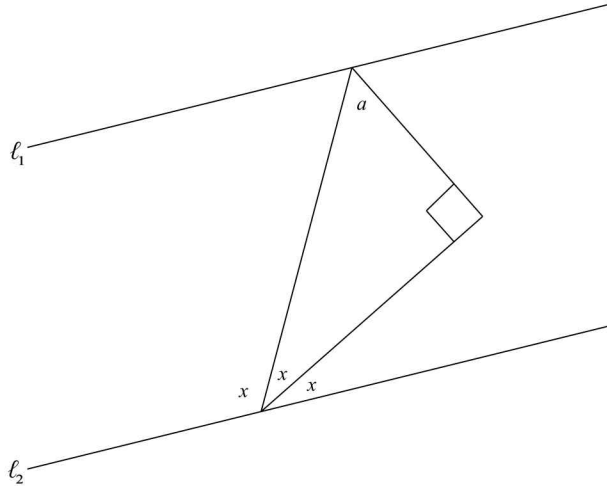**FOR QUESTION 17, CHOOSE THE <u>TWO</u> ANSWERS THAT APPLY.**
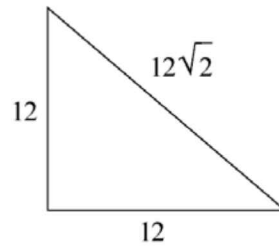
17. In the given triangle, what are the measures of the three angles?

(A) 30°

(B) 45°

(C) 60°

(D) 90°

(E) 110°

(F) 115°

FOR QUESTION 18, INDICATE <u>ALL</u> THE ANSWERS THAT APPLY.

18. If $x^2 - 11x - 12 = 0$, what are the two possible values for x?

(A) −12

(B) −1

(C) 0

(D) 1

(E) 12

practice test

FOR QUESTIONS 19–20, ENTER YOUR ANSWERS IN THE BOXES.

19. Lines 1 and 2 are parallel. What is the value of a?

20. In the barber shop, a haircut costs $22.50. How many haircuts must be done to cover the monthly rent of $1,276? Round the answer up to the nearest haircut.

STOP

If you finish before the time is up, you may check your work in this section only.