



## SECTION 8

Time — 20 minutes

16 Questions

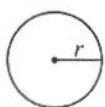
Turn to Section 8 (page 7) of your answer sheet to answer the questions in this section.

**Directions:** For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

Notes

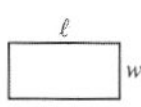
1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
4. Unless otherwise specified, the domain of any function  $f$  is assumed to be the set of all real numbers  $x$  for which  $f(x)$  is a real number.

Reference Information

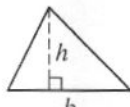


$$A = \pi r^2$$

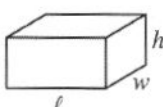
$$C = 2\pi r$$



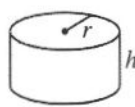
$$A = \ell w$$



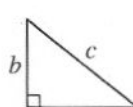
$$A = \frac{1}{2}bh$$



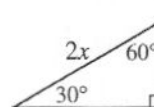
$$V = \ell wh$$



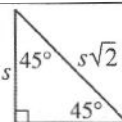
$$V = \pi r^2 h$$



$$c^2 = a^2 + b^2$$



Special Right Triangles

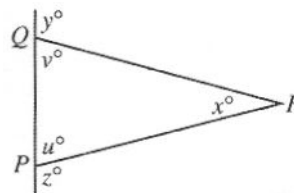


The number of degrees of arc in a circle is 360.

The sum of the measures in degrees of the angles of a triangle is 180.

1. Conall had a box of 36 candy bars to sell for a class fundraiser. He sold 10 of the bars on his own, and his mother sold half of the remaining bars to her coworkers. If no other bars were sold, what fraction of Conall's original 36 bars remained unsold?

- (A)  $\frac{5}{8}$   
 (B)  $\frac{11}{36}$   
 (C)  $\frac{1}{3}$   
 (D)  $\frac{13}{36}$   
 (E)  $\frac{7}{18}$



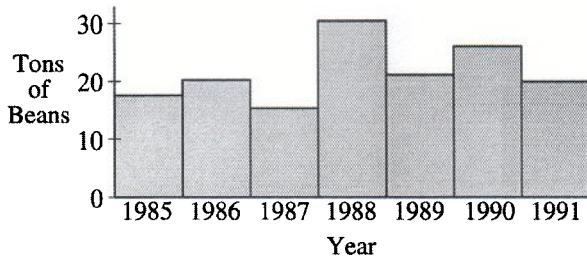
2. In  $\triangle PQR$  above,  $PR = QR$ . Which of the following must be true?

- (A)  $u$   
 (B)  $x$   
 (C)  $x = z$   
 (D)  $y = x$   
 (E)  $y$

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BEAN PRODUCTION



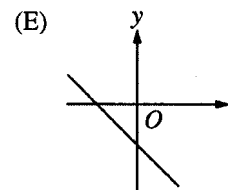
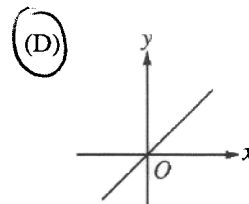
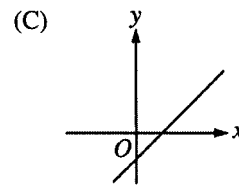
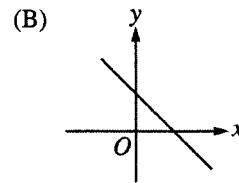
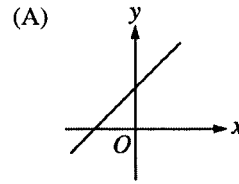
3. The bar graph above shows the number of tons of beans produced on a large farm for the years 1985 through 1991. For which of the following two-year periods was the average (arithmetic mean) bean production closest to the bean production in 1985?

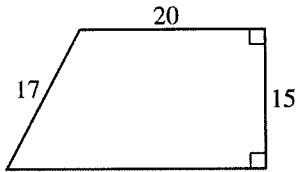
(A) 1986-1987  
 (B) 1987-1988  
 (C) 1988-1989  
 (D) 1989-1990  
 (E) 1990-1991

4. Marcus can spend no more than \$120 on jeans and shirts for school. He buys 3 pairs of jeans at \$32 each. If  $x$  represents the dollar amount he can spend on shirts, which of the following inequalities could be used to determine the possible values for  $x$ ?

(A)  $(3) \cdot 32 - x \leq 120$   
 (B)  $(3) \cdot 32 - x \geq 120$   
 (C)  $(3) \cdot 32 + x \leq 120$   
 (D)  $(3) \cdot 32 + x \geq 120$   
 (E)  $x \leq (3) \cdot 32$

5. If  $y$  is directly proportional to  $x$ , which of the following could be the graph that shows the relationship between  $y$  and  $x$ ?

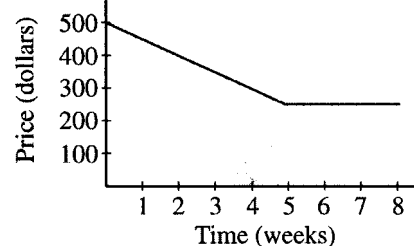
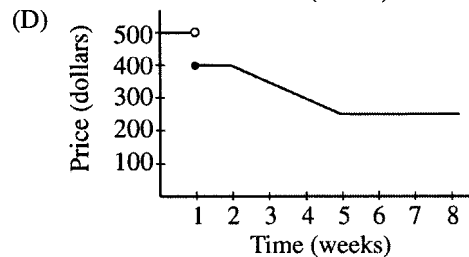
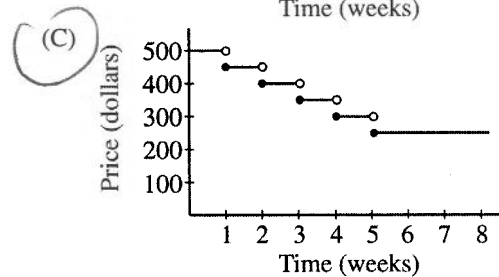
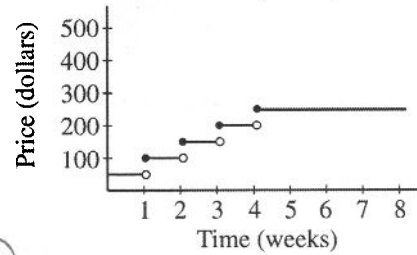
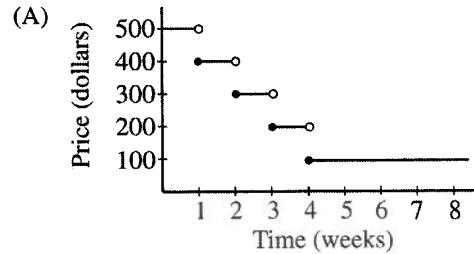




6. What is the perimeter of the trapezoid above?

- (A) 52
- (B) 72
- (C) 75
- ☒ (D) 80
- (E) 87

7. A store discounts merchandise by 10 percent of the original price at the end of each week and stops when the merchandise is priced at 50 percent of the original price. Which of the following graphs could correctly represent the price of an article of merchandise over an eight-week period?



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8. If  $\frac{x+y}{a-b} = \frac{2}{3}$ , then  $\frac{9x+9y}{10a-10b} =$

(A)  $\frac{9}{10}$

(B)  $\frac{20}{23}$

(C)  $\frac{20}{27}$

(D)  $\frac{2}{3}$

(E)  $\frac{3}{5}$

9. The interior dimensions of a rectangular fish tank are 4 feet long, 3 feet wide, and 2 feet high. The water level in the tank is 1 foot high. All of the water in this tank is poured into an empty second tank. If the interior dimensions of the second tank are 3 feet long, 2 feet wide, and 4 feet high, what is the height of the water in the second tank?

(A) 0.5 ft

(B) 1 ft

(C) 1.5 ft

(D) 2 ft

(E) 4 ft

1, 2, 3

10. If  $m$ ,  $n$ , and  $k$  are to be assigned different values from the list above, how many different values will be possible for the expression  $(m+n)^k$ ?

(A) Three

(B) Four

(C) Five

(D) Eight

(E) Nine

#### NUMBER OF EMPLOYEES AT COMPANY X

	First Shift	Second Shift
Salary over \$30,000	30	10
Salary \$30,000 or less	40	20

11. The table above shows the number of employees at Company X classified according to work shift and salary. If a second-shift employee will be picked at random, what is the probability that the employee's salary is over \$30,000?

(A)  $\frac{1}{2}$

(B)  $\frac{1}{3}$

(C)  $\frac{1}{10}$

(D)  $\frac{2}{3}$

(E)  $\frac{2}{5}$

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12. If  $x$  is a positive integer satisfying  $x^7 = k$  and  $x^9 = m$ , which of the following must be equal to  $x^{11}$ ?

(A)  $\frac{m^2}{k}$

(B)  $m^2 - k$

(C)  $m^2 - 7$

(D)  $2k - \frac{m}{3}$

(E)  $k + 4$

13. After the first term in a sequence of positive integers, the ratio of each term to the term immediately preceding it is 2 to 1. What is the ratio of the 8th term in this sequence to the 5th term?

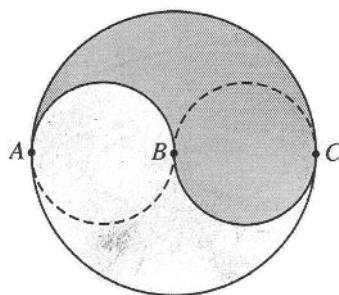
(A) 6 to 1

(B) 8 to 5

(C) 8 to 1

(D) 64 to 1

(E) 256 to 1



14. In the figure above, the smaller circles each have radius 3. They are tangent to the larger circle at points  $A$  and  $C$ , and are tangent to each other at point  $B$ , which is the center of the larger circle. What is the perimeter of the shaded region?

(A)  $6\pi$

(B)  $8\pi$

(C)  $9\pi$

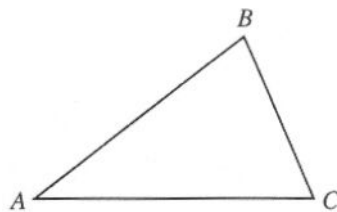
(D)  $12\pi$

(E)  $15\pi$



15. Each of the following inequalities is true for some values of  $x$  EXCEPT

- (A)  $x < x^2 < x^3$   
(B)  $x < x^3 < x^2$   
(C)  $x^2 < x^3 < x$   
(D)  $x^3 < x < x^2$   
(E)  $x^3 < x^2 < x$



Note: Figure not drawn to scale.

16. In the figure above,  $AC = 6$  and  $BC = 3$ . Point  $P$  (not shown) lies on  $\overline{AB}$  between  $A$  and  $B$  such that  $\overline{CP} \perp \overline{AB}$ . Which of the following could be the length of  $\overline{CP}$ ?

- (A) 2  
(B) 4  
(C) 5  
(D) 7  
(E) 8

**STOP**

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.