## PRACTICE QUESTIONS

> **FOR QUESTIONS 1–15, UNLESS THE DIRECTIONS STATE OTHERWISE, CHOOSE <u>ONE</u> ANSWER CHOICE.**

1. If the sum of two consecutive integers is 87 and the difference of their squares is 87, what is the larger integer?
   - (A) 44
   - (B) 46
   - (C) 54
   - (D) 69
   - (E) 87

2. Each year between 2001 and 2011, an Italian winemaker in Montalcino used between 75% and 80% of his grapes to produce his Brunello di Montalcino wine, and the rest to produce his Rosso di Montalcino wine. If in 2011 he produced 2,500 cases of Brunello, which of the following could have been the total number of cases of wine he produced that year?

   Indicate <u>all</u> such numbers of cases.
   - (A) 3,128
   - (B) 3,153
   - (C) 3,241
   - (D) 3,308
   - (E) 3,334

3. If a is a positive even integer less than 10, b is a negative even integer greater than –10, and c is a positive odd integer between 2 and 10, which of the following cannot be an integer?
   - (A) $\dfrac{bc}{a}$
   - (B) $\dfrac{ac}{b}$
   - (C) $\dfrac{ab}{c}$
   - (D) $\dfrac{ab}{c^2}$
   - (E) $\dfrac{2ab}{c^3}$

4. A drawer contains 20 pairs of socks: some white, some black, and the rest brown. Picking at random, one has a 0.4 probability of removing a white pair. If 1 white pair, 1 brown pair, and 3 black pairs are added, and no pairs are removed, what is the probability that one will pick at random either a black or a brown pair?

(A) 0.36

(B) 0.4

(C) 0.6

(D) 0.64

(E) 0.8

5. The average (arithmetic mean) weight of a football team's offensive linemen is 320 pounds, while the average weight of the team's defensive linemen is 300 pounds. If the team has at least 50% more defensive linemen than offensive linemen, which of the following could be the average weight of all of the team's offensive and defensive linemen, combined?

Indicate <u>all</u> such weights.

(A) 304

(B) 305

(C) 306

(D) 307

(E) 308

(F) 309

6. *ABCD* is a quadrilateral, with side *AB* parallel to side *CD*. Which of the following statements individually provide(s) sufficient additional information to determine whether *ABCD* is a rectangle or not?

Indicate <u>all</u> such statements.

(A) The diagonals *AC* and *BD* are of equal length.

(B) The diagonals *AC* and *BD* are not of equal length.

(C) The measure of angle *CDA* is 90°, and both pairs of opposite angles are equal.

7. In a high school orchestra, 40% of the string players are violinists, 20% are violists, 25% are cellists, and 15% are bassists. If 2 violinists, 1 violist, 1 cellist, and 1 bassist are added, what will be the percentage of violinists in the orchestra? (Assume no other changes to the orchestra's string section.)

(A) 30%

(B) 35%

(C) 40%

(D) 45%

(E) It cannot be determined.

8. If a and b are two of the solutions of the equation $x^3 - x^2 - 6x = 0$, with $a \neq 0$ and $a \neq b$, then which of the following could be the graph of $\dfrac{x}{a} > b$?

Indicate <u>all</u> such graphs.

(A)

(B)

(C)

(D)
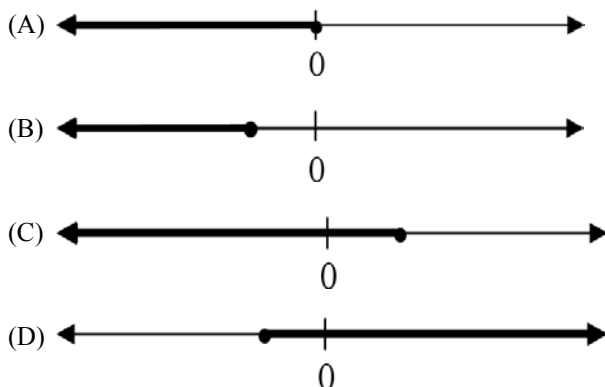
9. Each of the managers of a 20-person technical support team received $3000 as a year-end bonus, whereas each of the nonmanagers received $1200 as a year-end bonus. If the total amount that the 20 employees received was $31,200, how many of the team's members are managers?

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

QUESTIONS 10–12 ARE BASED ON THE FOLLOWING DATA.

INCOME DATA FOR TOWN X's FOUR NEIGHBORHOODS: A, B, C, and D.

Annual Income in 2011	Percent of Neighborhood Populations			
	A	B	C	D
$0–$24,999	14%	4%	17%	13%
$25,000–$49,999	30%	19%	34%	31%
$50,000–$74,999	26%	29%	27%	32%
$75,000–$99,999	19%	28%	15%	18%
$100,000–$249,999	9%	14%	6%	5%
> $250,000	2%	6%	1%	1%

10. In the neighborhood with the smallest percentage of six-figure earners in 2011, what percent of the population earned less than $50,000 that year?

(A) 23

(B) 31

(C) 34

(D) 44

(E) 51

11. If the percentage of people who resided in neighborhood B in 2011 and earned between $0 and $24,999 was 20% less than the percentage of people who resided in neighborhood B in 2001 and earned between $0 and $24,999, and if the latter percentage was 20% less than the percentage of people who resided in neighborhood B in 1991 and earned between $0 and $24,999, what percent of the people who resided in neighborhood B in 1991 earned between $0 and $24,999 that year?

(A) 4

(B) 5

(C) 6

(D) 6.25

(E) 6.67

12. Which of the following statements must be true?

Indicate <u>all</u> such statements.

(A) In 2011, the neighborhood with the highest average income was neighborhood B.

(B) 12% of the people living in town X in 2011 earned less than $25,000 that year.

(C) If in 2011 more than twice as many people lived in neighborhood A as in neighborhood B, then the number of people who lived in neighborhood A and earned $100,000 or more was greater than the number of people who lived in neighborhood B and earned $100,000 or more.

13. Which of the following graphs intersect(s) the graph of $y = x$?

Indicate <u>all</u> such graphs.

(A) The graph of $y = 2x + 2$

(B) The graph of $y = |2x + 2|$

(C) The graph of $y = -x + 2$

14. Streetlamps are to be placed along one side of a 1-kilometer-long road. Each streetlamp has a diameter of 50 centimeters. If the distance between streetlamps is 29.5 meters, and the first streetlamp is placed at one end of the road, how many streetlamps will be needed? (1 meter equals 100 centimeters. 1 kilometer equals 1,000 meters)

(A) 30

(B) 31

(C) 32

(D) 33

(E) 34

15. If x and y are integers such that $|x - y| = 1$, which of the following statements individually provide(s) sufficient additional information to determine what x is?

Indicate <u>all</u> such statements.

(A) x and y are the solutions of the equation $a^2 + 7a + 12 = 0$

(B) $y = 3$

(C) x and y are both prime numbers, and y is odd

PRACTICE QUESTIONS

> **FOR QUESTIONS 1–10, ENTER YOUR ANSWER IN THE BOXES.**

1. The average (arithmetic mean) of the salaries that four siblings earned last year is $50,000. If one of the siblings earned $80,000 and another earned $60,000, what is the average (arithmetic mean) of the salaries that the remaining two siblings earned last year?

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2. The perimeter of a square with a side of 4 inches is equal to the perimeter of a rectangle with a height of 3 inches. What fraction of the rectangle's area is the square's area?

Give your answer as a fraction.

$$\frac{\square}{\square}$$

3. Justin bought 160 shares of company A and 50 shares of company B for a total purchase price of $2450. At the same per-share prices, Susan bought 40 shares of company A and 50 shares of company B, for a total purchase price of $1250. How much did Justin pay in total for his shares of company A?

$ ⬚

4. Line *l* is perpendicular to line $2x = 3y - 6$. If the point $(0,2)$ lies on line *l*, what is the *x*-intercept of line *l*?

Give your answer as a fraction.

$$\frac{\square}{\square}$$

5. For all numbers *a* and *b*, $a \lozenge b = a^2 b$. What is the value of $\left[(-2) \lozenge (-3) \right] \lozenge (-2)$?

⬚

6. Company A, a widget manufacturer, has eight stores in town X. The average (arithmetic mean) number of widgets these stores sold in March 2006 is 150. Not including the company's flagship store in town X, the average (arithmetic mean) number of widgets the remaining seven stores sold in March 2006 is 130. How many widgets did the flagship store sell in March 2006?

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QUESTIONS 7–8 ARE BASED ON THE FOLLOWING DATA.

SALES OF NEW CARS IN COUNTRY A,
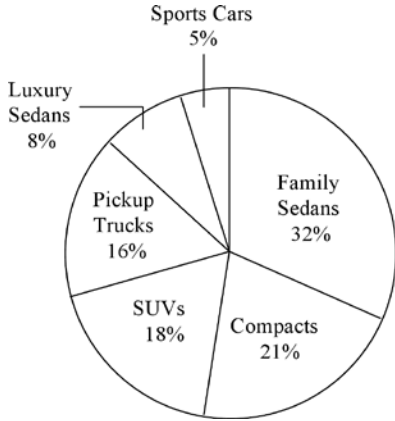
AVERAGE HIGHWAY FUEL CONSUMPTION, BY CATEGORY, FOR NEW CARS SOLD IN 2010

Category	Average Fuel Consumption
Compact Cars	32
Family Sedans	28
Luxury Sedans	24
Sports Cars	24
SUVs	23
Pickup Trucks	21

7. If in 2010 the total number of new cars that were sold across all categories was 1,621,018, how many categories of cars had sales of fewer than 250,000 cars?

☐

8. What was the average fuel consumption on the highway for all cars sold in 2010?

Give your answer to the nearest 0.1.

☐

9. Working alone at its constant rate, Machine A produces 15 widgets every 90 minutes. Working alone at its constant rate, Machine B produces widgets twice as quickly as does Machine A. If the two machines work together at their respective constant rates, how many hours will it take them to produce 75 widgets?

☐ hours

10. Two of the eight lawyers who work at a law firm are partners, while the rest are associates. If a team of five lawyers is to be selected randomly from among these eight lawyers, what is the probability that more than 80% of the lawyers on the team will be associates?

Give your answer to the nearest 0.01.

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PRACTICE QUESTIONS

> **FOR QUESTIONS 1–15, COMPARE QUANTITY A AND QUANTITY B. SOME QUESTIONS WILL HAVE ADDITIONAL INFORMATION ABOVE THE TWO QUANTITIES TO USE IN DETERMINING YOUR ANSWER.**
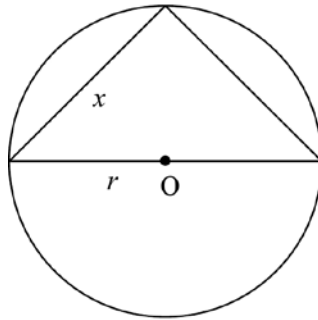
$$\frac{x}{y} - 4 = 0$$

$$x \neq 0, y \neq 0$$

1.   Quantity A   Quantity B

$$\frac{1}{x}$$ $$\frac{1}{y}$$

(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.

$$x < y$$

2.   Quantity A   Quantity B

$$-x^2$$ $$xy$$

(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 units digit of $23^8 \times 67^8 \times 89^8$ $\dfrac{4^{11} + 4^{10} + 4^9}{3 \times 4 \times 7} \times (4^{-4})^2$

(A) Quantity A is greater.

(B) Quantity B is greater.

(C) The two quantities are equal.

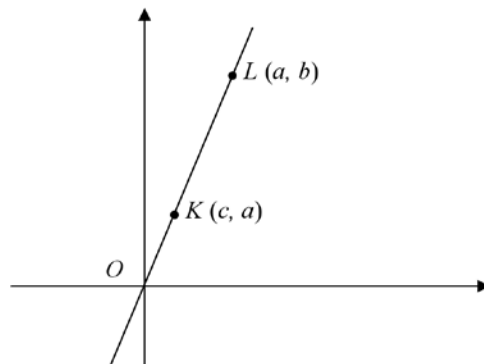(D) The relationship cannot be determined from the information given.

4.   Quantity A   Quantity B

The circumference of the circle
with center O and radius r $4x$

(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

$b - a$ $c - a$

(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.

Line l is defined by the equation $2x + y = 2$.

Line k is defined by the equation $3x + y = 4$.

6.

Quantity A	Quantity B
The x-coordinate of the point at which the two lines intersect	The slope of line l

(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
The sum of all multiples of 5 between 450 and 550, inclusive	The sum of all multiples of 10 between 400 and 600, inclusive

(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.

$$\frac{2x - xy}{3} = y - \frac{1}{3}xy$$

8.

Quantity A	Quantity B
$2x$	$2y$

(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.

9.

Quantity A	Quantity B
$\sqrt{230}$	The average (arithmetic mean) of all prime numbers between 10 and 20

(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.

10.

Quantity A	Quantity B
$\left(\dfrac{14}{42}\right)^4$	$\dfrac{1}{3} \times \dfrac{2}{9} \times \dfrac{3}{(-6)} \times \dfrac{(-1)}{3}$

(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.

ABC is a right triangle with legs of length $\dfrac{x}{y}$ and y.

11.   Quantity A   Quantity B

$\dfrac{x\left(5 - \sqrt{17}\right)\left(\sqrt{17} + 5\right)}{\sqrt{256}}$ The area of triangle ABC

(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.

12.   Quantity A   Quantity B

The number of prime numbers   The number of multiples of 3
between 1 and 100   between 1 and 100

(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.

$$xy^2 z^3 > 0$$
$$xyz < 0$$

13.   Quantity A   Quantity B
                      y xz

(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.

Point $P\,(a, b)$ lies in quadrant I of the rectangular coordinate system. Point $Q\,(m,n)$ is 180° rotationally symmetric to point P about the origin O.

14.   Quantity A   Quantity B

The distance between points P
and Q $\left[\left(\left|a\right| + \left|n\right|\right)^2 - 2\left|bm\right|\right]^{\frac{1}{2}}$

(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.

M and N are two right cylinders, such that the height of cylinder M is 10% greater than the height of cylinder N, and the radius of cylinder M is 10% less than the radius of cylinder N.

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

The surface area of cylinder M   The surface area of cylinder N

(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.