

## ACT Mathematics Practice Test A

Q.#.	Correct Answer	Cluster	Q#	Correct Answer	Cluster
1	B	PA	31	D	PG
2	J	PA	32	J	PG
3	C	pa	33	A	IA/CG
4	J	PG	34	G	EA
5	E	IA/CG	35	A	PG
6	F	T	36	G	IA/CG
7	E	EA	37	D	PG
8	H	EA	38	H	IA/CG
9	A	EA	39	D	A
10	G	IA/CG	40	F	IA/CG
11	B	PA	41	D	IA/CG
12	K	IA/CG	42	H	IA/CG
13	B	PG	43	A	EA
14	H	IA/CG	44	J	PG
15	A	IA/CG	45	A	EA
16	G	T	46	G	T
17	B	EA	47	B	PG
18	K	IA/CG	48	K	EA
19	D	PG	49	C	IA/CG
20	H	PG	50	F	EA
21	A	IA/CG	51	C	PA
22	G	EA	52	G	PA
23	A	EA	53	E	EA
24	K	PA	54	H	EA
25	D	EA	55	A	PG
26	G	PG	56	K	EA
27	C	PA	57	A	IA/CG
28	F	PG	58	H	IA/CG
29	B	PG	59	C	IA/CG
30	H	IA/CG	60	F	PA

SUMMARY

PA/EA - 28

IA/CG - 18

PG/T - 14

**Answer Key: Practice Test A – Page 1**

1.  $\frac{1}{3} - \frac{2}{15} + \frac{7}{25} = ?$

- A.  $\frac{6}{25}$     B.  $\frac{12}{25}$     C.  $\frac{6}{43}$     D.  $\frac{9}{43}$     E.  $\frac{12}{43}$

**Answer: B**

Since LCD = 75,  $\frac{1}{3} - \frac{2}{15} + \frac{7}{25} = \frac{25}{75} - \frac{10}{75} + \frac{21}{75} = \frac{36}{75} = \frac{12}{25}$

2. A car traveled 882 miles on 36 gallons of gasoline. How many miles per gallon did the car get on this trip?

- F. 21.5    G. 22.5    H. 23.5    J. 24.5    K. 25.5

**Answer: J**

$\frac{882 \text{ miles}}{36 \text{ gallons}} = 24.5 \text{ mpg}$

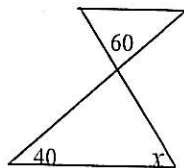
3. A yearly newspaper subscription price is \$95.00. At the newsstand the paper costs \$0.45 for each issue printed five days per week. How much money can be saved by purchasing the yearly subscription?

- A. \$9.00    B. \$12.00    C. \$22.00    D. \$32.00    E. \$43.00

**Answer: C**

Annual cost @ \$0.45/ issue, 5 days a week for a year =  $\$0.45 \times 5 \times 52 = \$117$ . Savings =  $\$117 - \$95 = \$22$ .

4. In the figure below, how many degrees is  $\angle x$ ?



- F.  $20^\circ$     G.  $40^\circ$     H.  $60^\circ$     J.  $80^\circ$     K.  $100^\circ$

**Answer: J**

Vertex angle in lower triangle =  $60^\circ$ , because it is vertical to the  $60^\circ$  in upper triangle. Since the sum of the angles in a triangle =  $180^\circ$ , then  $60 + 40 + x = 180$ , so  $100 + x = 180$ ,  $x = 80^\circ$ .

5. If  $4x - 3y = 10$ , what is the value of  $12x - 9y$ ?

- A.  $3x$     B.  $3y$     C. 10    D. 20    E. 30

**Answer: E**

$4x - 3y = 10$ . Multiplying by 3 we get  $12x - 9y = 30$

6. If  $\cos \alpha = \frac{3}{5}$  in the first quadrant, what does  $\cot \alpha$  equal?

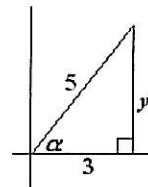
- F.  $\frac{3}{4}$     G.  $\frac{3}{5}$     H.  $\frac{4}{3}$     J.  $\frac{4}{5}$     K.  $\frac{5}{3}$

**Answer: F**

From Pythagorean Theorem the unknown side,  $y$ , of the triangle is given by  $3^2 + y^2 = 5^2$

$y^2 = 25 - 9 = 16$ ,  $y = \sqrt{16} = 4$

$\cot \alpha = \frac{\text{adj. side}}{\text{opp. side}} = \frac{3}{4}$



7. What is the positive value of  $\sqrt{\frac{1}{25}}$  less 0.20?

- A. 5                      B. 0.5                      C. 0.05                      D. 0.005                      E. 0

**Answer: E**

$$\sqrt{\frac{1}{25}} - 0.20 = \frac{\sqrt{1}}{\sqrt{25}} - 0.20 = \frac{1}{5} - 0.20 = 0.20 - 0.20 = 0$$

8. If the hypotenuse of isosceles right triangle  $ABC$  is  $8\sqrt{2}$ , what is the area of  $\triangle ABC$ ?

- F. 8                      G. 16                      H. 32                      J. 64                      K. 128

**Answer: H**

Since the right triangle is isosceles, then the legs are congruent by Pythagorean Theorem.

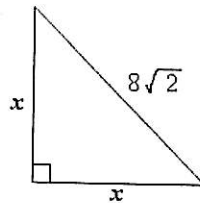
$$x^2 + x^2 = (8\sqrt{2})^2$$

$$2x^2 = 128$$

$$x^2 = 64$$

$$x = \sqrt{64} = 8$$

$$A = \frac{1}{2}bh = \frac{1}{2} 8 \cdot 8 = 32$$



9. It takes Mr. Smith  $H$  hours to mow his lawn. After three hours it begins to rain. How much of the lawn is not mowed?

- A.  $H-3$                       B.  $\frac{H-3}{3}$                       C.  $\frac{H}{3}-1$                       D.  $\frac{H-3}{H}$                       E.  $3H$

**Answer: A.  $H-3$**

Total mowing time =  $H$  hours. After 3 hours of mowing, time left =  $(H-3)$  hours.

10. Which of the following best describes the function graphed below?



- F. increasing at an increasing rate                      G. increasing at a decreasing rate  
 H. decreasing at an increasing rate                      J. decreasing at a decreasing rate  
 K. A relationship cannot be determined.

**Answer: G**

The graph is increasing but is slowly leveling off.

11. What is the quantity  $\frac{7+7+7}{-7-7-7}$  equal to?

- A. +1      B. -1      C. +21                      D. -21                      E. -3

**Answer: B**

$$\frac{7+7+7}{-7-7-7} = \frac{21}{-21} = -1$$

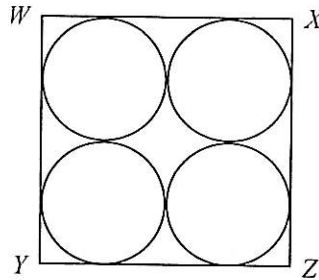
12. What do the graphs of  $y = 6x + 7$  and  $y = -2x + 7$  have in common?

- F. They are parallel to each other.                      G. They are perpendicular to each other.  
 H. They both pass through the point  $(6, -2)$ .                      J. They both have the same  $x$ -intercept.  
 K. They both have the same  $y$ -intercept.

**Answer: K**

By examination of the possible answers only K is correct. The  $y$ -intercept occurs when  $x = 0$ . When  $x = 0$ ,  $y = 6(0) + 7 = 7$  and  $y = -2(0) + 7 = 7$ .

13. In the sketch below, the area of each circle is  $4\pi$ . What is the perimeter of  $WXZY$ ?



- A. 8                      B. 32                      C.  $16\pi$                       D. 64                      E.  $4\pi$

**Answer: B**

For each circle:  $A = \pi r^2$                       each side of square  $= 4r = 4(2) = 8$ ; perimeter of square  $= 4(8) = 32$   
 $4\pi = \pi r^2$   
 $4 = r^2$   
 $r = 2$

14. The graph of  $y = x^3 + 3x^2 - 2x - 3$  crosses the  $x$ -axis in

- F. exactly two places                      G. one or two places                      H. two or three places  
J. one or three places                      K. A relationship cannot be determined.

**Answer: H**

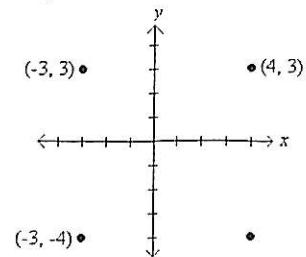
$$y = x^3 + 3x^2 - 2x - 3$$

15. In the coordinate plane, a square has vertices  $(4, 3)$ ,  $(-3, 3)$ ,  $(-3, -4)$ , and

- A.  $(4, -4)$                       B.  $(3, 4)$                       C.  $(0, 7)$                       D.  $(4, 0)$                       E. A relationship cannot be determined.

**Answer: A**

By sketching the points, the point to complete the square is  $(4, -4)$ .



16. If  $\csc \theta = \frac{4}{3}$ , what is the value of  $\sin \theta$ ?

- F.  $1\frac{1}{3}$                       G.  $\frac{3}{4}$                       H.  $\frac{4}{3}$                       J.  $\frac{3}{5}$                       K. 1

**Answer: G**

$$\sin \theta = \frac{1}{\csc \theta} = \frac{1}{\frac{4}{3}} = 1 \div \frac{4}{3} = 1 \times \frac{3}{4} = \frac{3}{4}$$

17. Which symbol below makes this expression true?  $2^4$        $4^2$

- A.  $>$                       B.  $=$                       C.  $<$                       D.  $+/-$                       E. A relationship cannot be determined.

**Answer: B**

Since  $2^4 = 16$  and  $4^2 = 16$ , then  $2^4 = 4^2$ .

18. If  $a^2 - b^2 = 648$ , and  $(a - b) = 24$ , what is the value of  $(a + b)$ ?

- F. 21                      G. 24                      H. 25                      J. 26                      K. 27

**Answer: K**

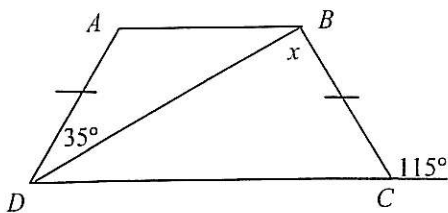
$$a^2 - b^2 = (a - b)(a + b)$$

$$648 = 24(a + b)$$

$$\frac{648}{24} = (a + b)$$

$$27 = a + b$$

19. Given trapezoid  $ABCD$  with  $\overline{AB} \parallel \overline{DC}$  and  $AD = BC$ . What is the measure of  $\angle x$ ?



- A. 5                      B. 65                      C. 75                      D. 85                      E. 95

**Answer: D**

$m \angle BCD = 180 - 115 = 65^\circ$ . Since  $AD = BC$ , then  $m \angle ADC = m \angle BCD$ . So  $m \angle BDC = 30^\circ$ . Using the angles in  $\triangle BDC$  we have

$$x + 30^\circ + 65^\circ = 180^\circ$$

$$x = 180^\circ - 95^\circ = 85^\circ$$

20. What is the ratio of the area of a circle with radius  $r$  to the circumference of a circle with radius  $2r$ ?

- F.  $2\pi : r$                       G.  $r : 2\pi$                       H.  $r : 4$                       J.  $1 : 1$                       K.  $4\pi : 2r$

**Answer: H**

$$A = \pi r^2 \text{ and } C = 2\pi(2r) = 4\pi r. \text{ Ratio of } A : C = \frac{A}{C} = \frac{\pi r^2}{4\pi r} = \frac{r}{4} = r : 4$$

21. The function  $\begin{matrix} M & N \\ O & P \end{matrix}$  is defined as  $MP - NO$ . What is the value of  $\begin{matrix} 2 & 4 \\ 6 & 8 \end{matrix}$ ?

- A. -8                      B. -6                      C. -4                      D. -2                      E. 4

**Answer: A**

$$\text{Since } \begin{matrix} M & N \\ O & P \end{matrix} = MP - NO, \text{ then } \begin{matrix} 2 & 4 \\ 6 & 8 \end{matrix} = (2)(8) - (4)(6) = 16 - 24 = -8.$$

22. In a classroom survey of twelve students, it was determined that one-half of the students belong to the Chess Club, one-third belong to the Drama Club, and one-fourth belong to both clubs. How many students are not in either club?

- F. 4                      G. 5                      H. 6                      J. 7                      K. 13

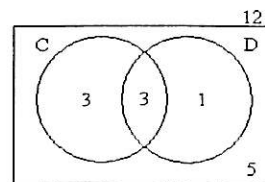
**Answer: G**

Since there are 12 students in total, Using a Venn diagram

$$\text{Chess Club has } \frac{1}{2}(12) = 6$$

$$\text{Drama Club has } \frac{1}{3}(12) = 4$$

$$\text{both clubs have } \frac{1}{4}(12) = 3$$



C – Chess Club; D – Drama Club

23. For which value of  $x$  is the inequality  $-2x \geq 6$  true?

- A. -3                      B. -2                      C. -1                      D. 0                      E. 4

**Answer: A**

$$-2x \geq 6$$

$x \leq -3$  (Reverse the inequality symbol when we multiply or divide by a negative number.)

24. One billion minus one million = ?

- F. 10 million              G. 99 million              H. 100 million              J. 101 million              K. 999 million

**Answer: K**

$$1,000,000,000$$

$$- \frac{1,000,000}{999,000,000}$$

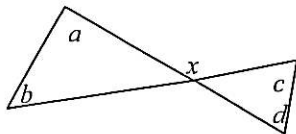
25. The houses on the odd side of Park Avenue are numbered consecutively. How many houses are there with an address less than 1500 and greater than 1465?

- A. 14              B. 15                      C. 16                      D. 17                      E. 18

**Answer: D. 17**

Solution: The total number of houses with odd numbers are 1467, 1469, ... 1499. By counting we get 17.

26. Given the sketch below, what is the value of  $a + b + c + d$ ?



- F.  $x$                       G.  $2x$                       H.  $180 - x$                       J.  $180 - 2x$                       K. 90

**Answer: G**

From geometry theorem, the exterior angles of a triangle = sum of the remote interior angles.

So  $x = a + b$

and  $x = c + d$

adding  $2x = a + b + c + d$

27. Assuming  $a \neq 0$ , what is the value of  $a$  in  $\frac{(15)(16)}{a} = (3)(4)(5)$ ?

- A. -4                      B. 0                      C. 4                      D. 31                      E. 60

**Answer: C**

$$\frac{(15)(16)}{a} = (3)(4)(5)$$

$$\frac{(3)(5)(4)(4)}{a} = (3)(4)(5)$$

$$\frac{4}{a} = 1$$

$$4 = a$$

28. If  $p$  and  $q$  are both positive integers and  $\frac{p-q}{5} = \frac{4}{10}$ , which of the following is true?

- F.  $p > q$                       G.  $q > p$                       H.  $p = q$   
 J.  $5p = 4q$                       K. A relationship between  $p$  and  $q$  cannot be determined.

**Answer: F**

If  $\frac{p-q}{5} = \frac{4}{10}$  then  $\frac{p-q}{5} = \frac{2}{5}$ , so  $p - q = 2$ . Since  $p - q$  is positive, then  $p > q$ .

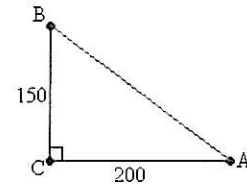
29. City A is 200 miles east of City C. City B is 150 miles directly north of City C. What is the shortest distance (in miles) between City A and City B?

A. 200                      B. 250                      C. 300                      D. 350                      E. 400

**Answer: B**

Solution: The shortest distance is  $AB$ . Using the Pythagorean Theorem

$$\begin{aligned} 150^2 + 200^2 &= AB^2 \\ 22,500 + 40,000 &= AB^2 \\ 62,500 &= AB^2 \\ AB &= \sqrt{62,500} = (\sqrt{625})(\sqrt{100}) = 25 \cdot 10 = 250 \end{aligned}$$



30. The relation  $\triangle R$  is defined as  $\triangle R = R^2 - 1$ .  $\triangle 8 = ?$

F. 7                      G. 21                      H. 63                      J. 64                      K. 512

**Answer: H**

$$\triangle 8 = 8^2 - 1. \quad \triangle 8 = 8^2 - 1 = 64 - 1 = 63$$

31. A 24-inch diameter pizza is cut into eight slices. What is the area of one slice?

A.  $3\pi$                       B.  $6\pi$                       C.  $12\pi$                       D.  $18\pi$                       E.  $\frac{\pi}{8}$

**Answer: D**

Radius of pizza:  $r = 12$  in.  $A = \pi r^2 = \pi(12)^2 = 144\pi$ . Area of each slice  $= \frac{144\pi}{8} = 18\pi$

32. The perimeter of a rectangle is 26 units. Which of the following cannot be dimensions of the rectangle?

F. 1 and 12                      G. 4 and 9                      H. 8 and 5                      J. 10 and 6                      K. 11 and 2

**Answer: J**

If the perimeter of a rectangle is 26, then the sum of a length and a width must be 13.

33.  $M$  is the midpoint of line segment  $RS$ . If  $\overline{RM} = 3x + 1$  and  $\overline{RS} = 38$ , what is the value of  $x$ ?

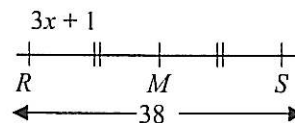
A. 6                      B. 12                      C. 18                      D. 19                      E. 21

**Answer: A**

Since  $RM = MS$ , then  $3x + 1 = 19$

$$3x = 18$$

$$x = 6$$



34. Assuming  $x \neq 0$ , how can the expression  $(3x)^2 + 6x^0 + (5x)^0$  be simplified?

F.  $3x^2 + 11$                       G.  $9x^2 + 7$                       H.  $3x^2 + 6$                       J.  $9x^2 + 11$                       K.  $6x^2 + 5$

**Answer: G**

$$(3x)^2 + 6x^0 + (5x)^0 = 9x^2 + 6 \cdot 1 + 1 = 9x^2 + 7$$

35. Which of the following triples cannot be the lengths of the sides of a triangle?

A. 1, 2, 3                      B. 4, 5, 6                      C. 7, 8, 9                      D. 10, 11, 12                      E. 13, 14, 15

**Answer: A**

A triangle is possible if the sum of the two smallest sides is  $>$  largest side. Clearly,  $1 + 2$  is not greater than 3.

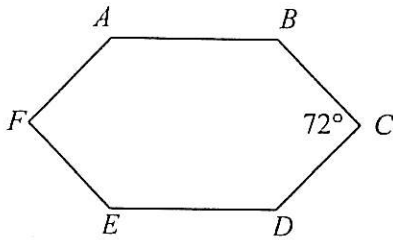
36. How many two-digit numbers have a remainder of 2 when divided by 10 and also have a remainder of 2 when divided by 4?

F. 2                      G. 4                      H. 6                      J. 8                      K. infinitely many

**Answer: G**

All two-digit numbers that have a remainder of 2 when divided by 10 are: 12, 22, 32, 42, 52, 62, 72, 82, and 92. Of these, only 22, 42, 62, and 82 have a remainder of 2 when divided by 4.

37. In the figure below,  $ABCDEF$  is a hexagon and  $m\angle BCD = 72^\circ$ . What is the ratio of  $m\angle BCD$  to the sum of the interior angles of  $ABCDEF$ ?



- A. 1 : 4      B. 1 : 6      C. 1 : 8      D. 1 : 10      E. 1 : 12

**Answer: D**

The sum of the interior angles of a hexagon =  $720^\circ$ . Ratio =  $\frac{72}{720} = \frac{1}{10}$

$$\begin{aligned}(n-2)180 &= (6-2)180 \\ &= (4)180 \\ &= 720\end{aligned}$$

38. Given that  $r$  varies directly as the square of  $d$ , and  $r = 48$  when  $d = 4$ , what is the value of  $r$  when  $d = 20$ ?

- F. 240      G. 400      H. 1,200      J. 1,240      K. 1,440

**Answer: H**

Since  $r$  varies directly as the square of  $d$ ,  $r = kd^2$ , where  $k$  is a constant. Now,  $48 = k \cdot (4)^2 = 16k$  and  $3 = k$ . So,  $r = 3d^2$  and when  $d = 20$ ,  $r = 3(20)^2 = 3 \cdot 400 = 1,200$ .

39. Roger is a baseball player who gets a hit about  $\frac{1}{3}$  of the times he comes to bat. Last year he batted 636 times. Assuming he had no "walks," how many outs did he make?

- A. 202      B. 212      C. 221      D. 424      E. 633

**Answer: D**

$\frac{1}{3}$  hits means  $\frac{2}{3}$  outs. For 636 times at bat, the number of outs =  $\frac{2}{3} \times 636 = 424$ .

40. What is the slope of the line perpendicular to a line with the equation  $ax + by = c$ ?

- F.  $\frac{b}{a}$       G.  $-\frac{b}{a}$       H.  $\frac{c}{a}$       J.  $-\frac{a}{b}$       K.  $b^2 - 4ac$

**Answer: F**

$$ax + by = c$$

$$by = -ax + c$$

$$y = -\frac{a}{b}x + \frac{c}{b}$$

A perpendicular line will have slope =  $\frac{b}{a}$ .

41. If  $(x - y) = 15$ , what is the value of  $x^2 - 2xy + y^2$ ?

- A. 25      B. 30      C. 125      D. 225      E. 625

**Answer: D**

$$\begin{aligned}(x - y) &= 15 \\ (x - y)^2 &= 15^2 \\ x^2 - 2xy + y^2 &= 225\end{aligned}$$



42. A woman has two rectangular gardens. The larger garden is five times as wide and three times as long as the smaller one. If the area of the smaller one is  $x$ , what is the difference in size of the two gardens?

- F.  $5x$                       G.  $7x$                       H.  $14x$                       J.  $15x$                       K.  $20x$

**Answer: H.  $14x$**

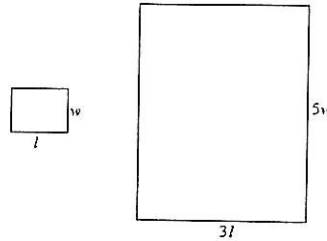
Solution: For smaller area  $x$ ,  $x = lw$

For larger area  $A$ ,  $A = 15lw$

Difference:  $A - x = 15lw - lw$

$$= 14lw$$

$$= 14x$$



43. If  $b^4 - 5 = 226$ , what is the value of  $b^4 + 9$ ?

- A. 240      B. 235                      C. 231                      D. 221                      E. 212

**Answer: A**

$$b^4 + 5 = 226$$

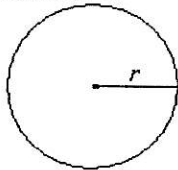
$$b^4 = 231$$

$$b^4 + 9 = 231 + 9 = 240$$

44. If the radius of a circle is reduced by 50 percent, by what percent is its area reduced?

- F.  $33\frac{1}{3}\%$                       G. 50%                      H.  $66\frac{2}{3}\%$                       J. 75%                      K. 80%

**Answer: J**



$$A_1 = \pi r^2$$



$$A_2 = \pi \left(\frac{1}{2}r\right)^2 = \frac{\pi r^2}{4}$$

Area is reduced by  $\pi r^2 - \frac{1}{4}\pi r^2 = \frac{3}{4}\pi r^2$ ; Percent reduction =  $\frac{\frac{3}{4}\pi r^2}{\pi r^2} \times 100 = 75\%$ .

45. If  $12x = 216$ , what is the value of  $\frac{x}{9}$ ?

- A. 2                      B. 6                      C. 12                      D. 18                      E. 81

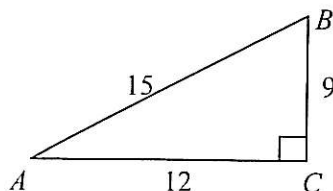
**Answer: A**

$$12x = 216$$

$$x = \frac{216}{12} = 18$$

$$\frac{x}{9} = \frac{18}{9} = 2$$

46. What is the value of  $\cos B$  in the sketch below?

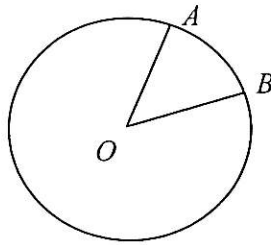


- F.  $\frac{2}{5}$                       G.  $\frac{3}{5}$                       H.  $\frac{4}{5}$                       J.  $\frac{5}{3}$                       K.  $\frac{5}{4}$

Answer: G

$$\cos B = \frac{\text{side adjacent to } B}{\text{hypotenuse}} = \frac{9}{15} = \frac{3}{5}$$

47. Given circle  $O$  with minor arc  $\widehat{AB} = 60^\circ$  and  $OA = 12$ . What is the area of sector  $AOB$ ?



- A.  $12\pi$     B.  $24\pi$     C.  $36\pi$     D.  $72\pi$     E.  $720\pi$

Answer: B

Sector  $AOB$  occupies  $\frac{60}{360} = \frac{1}{6}$  of the circle. Area of circle =  $\pi r^2 = 144\pi$ , so area of sector =  $\frac{1}{6}(144\pi) = 24\pi$ .

48. If both  $a$  and  $b$  are negative, what is the value of  $a - b$ ?

- F. positive    G. negative    H. zero    J. one    K. A relationship cannot be determined.

Answer: K

If both  $a$  and  $b$  are negative, then either  $a \geq b$  so  $a - b \geq 0$  or  $a \leq b$  so  $a - b \leq 0$ . There is no conclusion.

49. If  $3^{n+1} = 81$ , what is the value of  $n$ ?

- A. 1    B. 2    C. 3    D. 4    E. 5

Answer: C

If  $3^{n+1} = 81$ , then  $3^{n+1} = 3^4$ , so  $n + 1 = 4$  and  $n = 3$ .

50. A man walks  $d$  miles in  $t$  hours. At that rate, how many hours will it take him to walk  $m$  miles?

- F.  $\frac{mt}{d}$     G.  $\frac{d}{t}$     H.  $\frac{md}{t}$     J.  $\frac{dt}{m}$     K.  $dtm$

Answer: F

$d$  miles in  $t$  hours is a rate of  $\frac{d}{t}$  mph. For  $m$  miles time =  $\frac{t}{d} \cdot m = \frac{mt}{d}$ .

51. Which of the following has the greatest number of integer factors other than itself and one?

- A. 12    B. 16    C. 24    D. 27    E. 29

Answer: C

$$12 = 1 \cdot 12, 2 \cdot 6, 3 \cdot 4$$

$$16 = 1 \cdot 16, 4 \cdot 4, 8 \cdot 2$$

$$24 = 1 \cdot 24, 2 \cdot 12, 3 \cdot 8, 4 \cdot 6$$

$$27 = 1 \cdot 27, 3 \cdot 9$$

$$29 = 1 \cdot 29$$

52. Paterson Pond was stocked with 2,000 fish, all bass and trout. The ratio of bass to trout was 3 : 2. How many of each type were put in the pond?

- F. 800 bass and 1,200 trout    G. 1,200 bass and 800 trout  
H. 600 bass and 1,400 trout    J. 800 bass and 1,000 trout  
K. 300 bass and 200 trout

Answer: G

Number of bass =  $\frac{3}{5} \times 2,000 = 1,200$ ; number of trout =  $\frac{2}{5} \times 2,000 = 800$

53. A computer program generates a list of triples  $(a, b, c)$  such that

$a$  is an even number less than 16,  
 $b$  is a perfect square, and  
 $c$  is a multiple of 5 between  $a$  and  $b$ .

Which of the following triples does not meet those conditions?

- A. (14, 36, 25)      B. (10, 25, 20)      C. (6, 64, 50)      D. (2, 25, 15)      E. (2, 16, 12)

**Answer: E**

Clearly, (2, 16, 12) does not meet all conditions for  $a, b,$  and  $c$ .

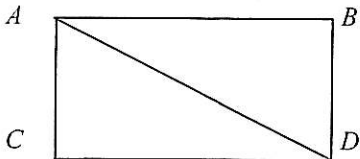
54. If  $(y + 2)(5y - 2) = 0$  and  $y > 0$ , what is the value of  $y$ ?

- F. 2      G.  $\frac{5}{2}$       H.  $\frac{2}{5}$       J. 0      K. -2

**Answer: H**

If  $(y + 2)(5y - 2) = 0$ , then  $y + 2 = 0$  or  $5y - 2 = 0$ . So  $y = -2$  or  $y = \frac{2}{5}$ , but  $y > 0$  so  $y = \frac{2}{5}$ .

55. Given the sketch below, which of the following statements about rectangle  $ABDC$  is true?



- A.  $AB + BD > AD$       B.  $AB + BD < AD$       C.  $AB + BD = AD$   
 D.  $(AB)(BD) = AD$       E. A relationship cannot be determined.

**Answer: A**

By the triangle inequality, the sum of any two sides of a triangle must be greater than the third side.

56. Given:  $4a + 5b - 6 = 0$  and  $4a - 2b + 8 = 0$ , what is the value of  $b$ ?

- F. -2      G.  $-\frac{1}{2}$       H. 0      J.  $\frac{1}{2}$       K. 2

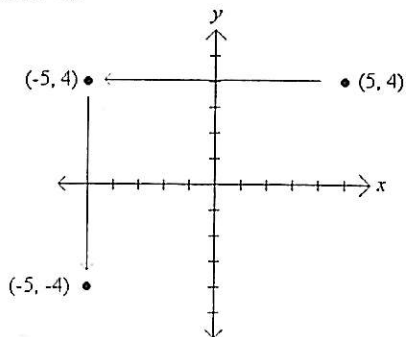
**Answer: K**

$$\begin{aligned} 4a + 5b - 6 = 0 &\Rightarrow 4a + 5b - 6 = 0 \\ -1 \cdot (4a - 2b + 8 = 0) &\Rightarrow -4a + 2b - 8 = 0 \\ 7b - 14 &= 0 \\ 7b &= 14 \\ b &= 2 \end{aligned}$$

57. If the ordered pair  $(5, 4)$  is reflected across the  $y$ -axis and then reflected across the  $x$ -axis, what are the new coordinates of that point?

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

**Answer: A**



58. A 45-rpm record revolves 45 times per minute. Through how many degrees will a point on the edge of the record move in 2 seconds?

- F. 180                      G. 360                      H. 540                      J. 720                      K. 930

**Answer: H**

Since 1 revolution =  $360^\circ$ , 45 times per minute is  $(45 \times 360)^\circ$  in 60 seconds or  $\frac{45 \times 360}{60}$  in 1 second =  $270^\circ$  in 1 second or  $540^\circ$  in 2 seconds.

59. If  $|x + 8| = 12$ , what is the value of  $x$ ?

- A. 4 only                      B. 20 only                      C. either -20 or 4                      D. either -4 or 20                      E. either 0 or 12

**Answer: C**

$$|x + 8| = 12$$

$$x + 8 = 12 \text{ or } x + 8 = -12$$

$$x = 4 \text{ or } x = -20$$

60. Which of the following has the same result as reducing an item in price using successive discounts of 30% and 20%?

- F. multiplying the original price by 56%                      G. dividing the original price by 50%  
H. multiplying the original price by 44%                      J. dividing the original price by 44%  
K. either multiplying the original price by 50% or by 30% and then 20%

**Answer: F**

Let original price be  $x$ . After a 30% reduction, price is  $.70x$ . After a 20% reduction, price is 80% of  $.70x = (.80)(.70x) = .56x = 56\%$  of  $x$ .