

1. What is the probability of getting a sum of sixteen in tossing three standard cubical dice? Give your answer as a common fraction.

a.  $\frac{1}{36}$       b.  $\frac{1}{18}$       c.  $\frac{1}{9}$       d.  $\frac{5}{36}$       e. NG

2. What is the value of  $a$  in the following equation?

$$720 = 2^a \cdot 5 \cdot 3^2$$

a. 4      b. 8      c. 16      d. 32      e. NG

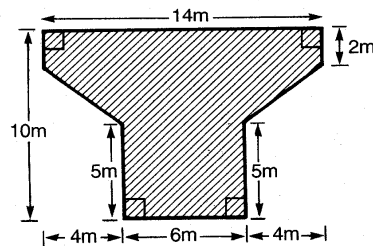
3. A rectangular box has dimensions 30 cm, 15 cm, and 40 cm. What is the number of square cm in its total surface area?

a.  $85 \text{ cm}^2$       b.  $2250 \text{ cm}^2$       c.  $5500 \text{ cm}^2$       d.  $18,000 \text{ cm}^2$       e. NG

4. Solve for  $x$ :  $3(2x + 5) - 3x = 2(x + 5) + 3(4 - 2x)$ .

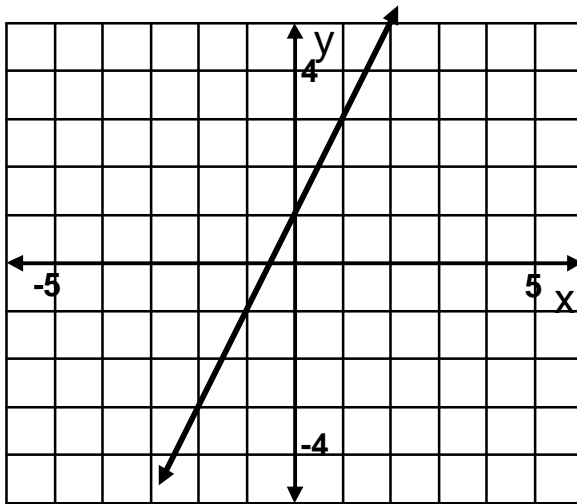
a.  $-3\frac{1}{7}$       b. 1      c.  $4\frac{2}{7}$       d. 22      e. NG

5. The cross section of a concrete highway support is shown. Find the number of square meters in the area of the shaded cross section.

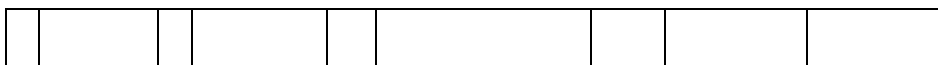


a.  $42 \text{ m}^2$       b.  $64 \text{ m}^2$       c.  $88 \text{ m}^2$       d.  $98 \text{ m}^2$       e. NG

6. What is the equation of the line shown in the graph?



- a.  $y = -2x + 1$     b.  $y = -2x - 1$     c.  $y = \frac{1}{2} + 1$     d.  $y = 2x + 1$     e. NG
7.  $AB$  is a meter stick divided into centimeters, with point  $A$  at 0 and point  $B$  at 100. At which centimeter mark should  $C$  be located so that ratio of  $AC$  to  $CB$  is 21:4?
- a. 4                      b. 21                      c. 25                      d. 84                      e. NG
8. Evaluate  $5 \cdot 3$ , if  $p \cdot q = p^2 - q^2$ .
- a. 2                      b. 4                      c. 15                      d. 16                      e. NG
9. How many rectangles are in the figure below?

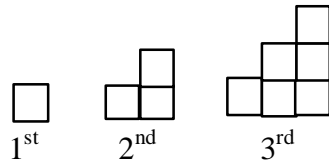


- a. 10                      b. 21                      c. 45                      d. 52                      e. NG

10. On a multiple choice test of 124 questions, the answers follow a repeated pattern of B-D-A-C. If a student answers with a repeated pattern of A-B-B-C-D, what percent of the questions will be answered correctly?

a. 0%      b. 25%      c. 45%      d. 80%      e. NG

11. How many squares are needed to build the tenth shape in the pattern?



a. 30      b. 45      c. 55      d. 66      e. NG

12. How many negative integers satisfy:  $x + 7.8 \geq 4.3$ ?

a. 1      b. 3      c. 5      d. 7      e. NG

13. Evaluate:

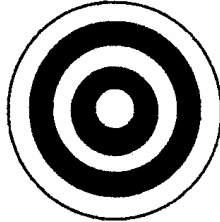
$$\frac{1}{x} + 4x \text{ if } x = \frac{1}{4}$$

a.  $1\frac{1}{4}$       b. 2      c.  $4\frac{1}{4}$       d. 5      e. NG

14. If  $a = 3$ ,  $b = -2$ , and  $c = 5$ , find the value of:  $\frac{ab^2(c^2-5)}{abc}$

a. -8      b. 8      c. 2      d. -2      e. NG

15. In the figure shown the concentric circles have radii of 1, 2, 3, 4, and 5. What percent of the entire region is shaded? (Picture is not drawn to scale.)



- a. 20%      b. 30%      c. 40%      d. 50%      e. NG
16. Evaluate  $1^0 + 2^1 + 3^2 + 4^3$ .
- a. 16      b. 20      c. 75      d. 76      e. NG
17. Find the absolute value of the difference between 28 and the sum of all positive divisors of 28.
- a. -56      b. 56      c. -28      d. 28      e. NG
18. How many different messages can be represented by sequences of length 5 that use three dashes and two dots?
- a. 9      b. 5      c. 6      d. 30      e. NG
19. Seventy-five children went to an amusement park where they could ride on a merry-go-round, roller coaster, and Ferris wheel. Twenty of them took all three rides, and 55 of them took at least two of the three rides. Each ride cost \$0.50 and the total receipt was \$70.00. Determine the number of children who did not try any of the rides.
- a. 0      b. 5      c. 10      d. 20      e. NG

20. In how many ways can two integers be selected from the integers 1, 2, 3, .....100 so that their difference is exactly 7?
- a. 23            b. 47            c. 93            d. 100            e. NG
21. If a round 8-inch diameter pizza serves two students, how many students should two 12-inch diameter pizzas serve?
- a. 9            b. 8            c. 6            d. 4            e. NG
22. The measures of the angles of a triangle are in the ratio 1:2:3. What is the measure (in degrees) of the smallest angle?
- a.  $10^\circ$             b.  $30^\circ$             c.  $60^\circ$             d.  $180^\circ$             e. NG
23. The measure of one angle of a parallelogram is  $115^\circ$ . How many degrees are in the measure of an adjacent angle of the parallelogram?
- a.  $65^\circ$             b.  $85^\circ$             c.  $115^\circ$             d.  $180^\circ$             e. NG
24. The set of ordered pairs below define a function:  
 $\{ (3,1), (-1,1), (2,4), (-2,4) \}$   
What is the range of the function?
- a.  $\{ 3,4 \}$             b.  $\{ -2,3 \}$             c.  $\{ -2,4 \}$             d.  $\{ 1,4 \}$             e. NG

25. How many three-digit numbers of the form  $6\square 4$  are divisible by 3?
- a. 0            b. 1            c. 2            d. 3            e. NG
26. In which quadrant is the point  $(-2, -3)$  located in the coordinate plane?
- a. I            b. II            c. III            d. IV            e. NG
27. A four sided fair die has faces labeled 1, 2, 3 and 4. What is the probability of rolling a sum of 8 with a toss of 2 such dice? Give your answer as a common fraction.
- a.  $\frac{1}{4}$             b.  $\frac{1}{8}$             c.  $\frac{1}{16}$             d.  $\frac{5}{36}$             e. NG
28. If  $f(x) = 3x + 1$  find  $f(7)$ .
- a. 11            b. 22            c. 38            d. 2188            e. NG
29. Find the units digit of  $7^{22}$ .
- a. 3            b. 4            c. 8            d. 9            e. NG
30. Evaluate:  
 $(a + b)(a - b)$  if  $a = 30$  and  $b = 2$
- a. 3228            b. 896            c. 840            d. 88            e. NG