

Olympiad Aptitude Test

Mathematics- Grade 10

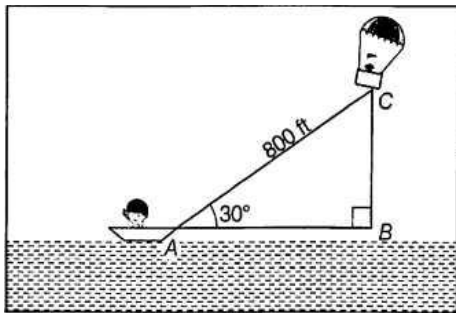
1. The cost of 3 books and 5 notebooks is Rs. 250 and the cost of 4 books and 4 notebooks is Rs 280. If cost of book is represented by x and cost of notebook is represented by y , then which of the following represent the correct equation?

- a. $3x + 5y = 280, 4x + 4y = 250$
 b. $3x+5y = 250, 4x + 4y = 280$
 c. $4x+ 3y = 250, 3x + 4y = 280$
 d. None of the above

2. A dishonest dealer professes to sell his goods at cost price but uses 750 g for a kg weight. His gain per cent is

- a 25% b 30%
 c 40% d None of these

3. A motorboat is pulling a parasailer. The line to the parasailer is 800 ft long. The angle between the line and the water is about 30° . How high is the parasailer?



- a 300 ft b 350 ft
 c $300\sqrt{3}$ ft d 400 ft

4. If the coordinates of the end point of the diameter of a circle with centre $(-1,2)$ are $(5, 9)$, then what are the coordinates of the other end point of the diameter?

- a $(-7,-5)$ b $(-5,-7)$
 c $(7,-5)$ d $(-7, 5)$

5. The mean of five numbers is 42. If one of the numbers is excluded the mean gets reduced by 1. The excluded number is

- a 42 b 44
 c 46 d 36

6. A box contains only pens and pencils. There are three times as many pens as pencils. If one writing tool is to be selected at random from the box, what is the probability that the tool is a pen?

- a. $1/3$ b. $1/4$
 c. $3/4$ d. $4/3$

7. Global Tea Estate began production in 1999, it produced 8000 cartons of tea, it is projected that production will increase by 50 cartons each year. Also, the production cost for first year was Rs. 70 per carton which reduced by 2 each successive year and the selling price of each carton increases by 10% of the production cost of year 1999.

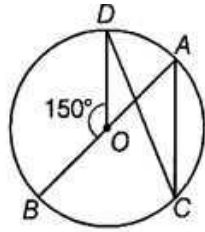
Find the total production from start when it has just increased production by 30% over the initial figure.

- a 450000 b 480000
 c 480500 d 450800

8. Ages of A and B are in the ratio of 2 : 3 respectively. 6 yr hence, the ratio of their ages will become 8:11 respectively. What is B's present age?

- a. 18 yr b. 24 yr
 c. 27 yr d. 28 yr

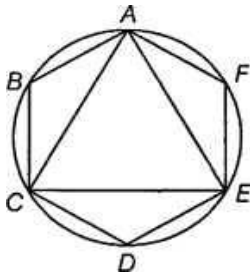
9. In the given figure, AOB is a diameter of a circle with centre O . If $\angle BOD = 150^\circ$, find $\angle ACD$.



- a 15° b 60°
 c 30° d 90°

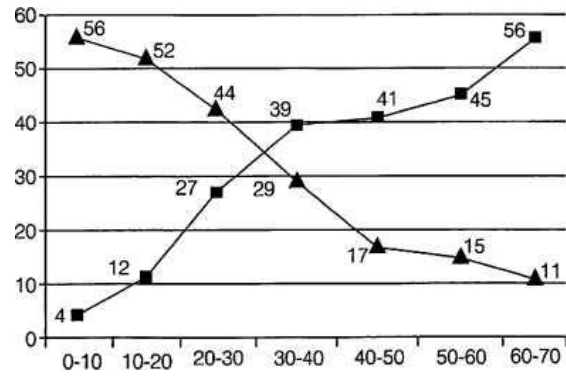
10. If the area of the triangle with vertices $(0, -2)$, $(1, y)$ and $(2, 0)$ is 4 sq units, then the value of y is
 a. -5 b. 1
 c. 0 d. None of these

11. In the below figure, if a regular hexagon $ABCDEF$ is inscribed in a circle. Then, which of the following statements is/are true?



- a. $\triangle ACB$ is an equilateral triangle
 b. $\triangle AFE$ is an isosceles triangle
 c. Both (a) and (b)
 d. None of the above
12. A person can row 4 km upstream and 12 km downstream in 4 h. If he can row 6 km upstream and 6 km downstream in 4 h. Then, the speed of person in still water and speed of current is
 a. 4 km, 4 km
 b. 2 km, 4 km
 c. 4 km, 2 km
 d. None of the above

Directions (Q. Nos. 13-14) *Given below are the ogives for some data. On the basis of it, answer the following questions.*



13. The modal class of the given data is
 a 10-20
 b 60-70
 c 20-30
 d 30-40

14. The correct frequency table for the given data is

- a f 4 8 12 15 2 4 11
 b f 4 8 15 12 4 2 11
 c f 4 8 15 12 2 4 11
 d None of the above

15. Which of the following statements is correct?

- a. $x^4 + 1$ when divided by $x + 1$ leaves remainder 2
 b. $x^4 + 1$ when divided by $x + 1$ leaves remainder 1
 c. $x^4 + 1$ when divided by $x - 1$ leaves remainder -1
 d. $x^4 + 1$ when divided by $x - 1$ leaves remainder -2

16. There are 15 books on a book shelf. Out of these, seven books are on Mathematics, five books are on English and the remaining books are on History. If Ramesh picks a book at random, then what is the probability that the book picked up is either on English or on History

- a. $1/5$ b $\frac{5}{7}$ c $\frac{2}{5}$ d $\frac{8}{15}$

17. If both 11^2 and 3^3 are factors of the number $a \times 4^3 \times 6^2 \times 13^{11}$, then what is the smallest possible value of a ?

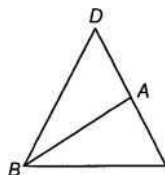
- a. 121 b. 1331
c. 363 d. 993

18. Each number in the first 200 natural numbers is written on a separate but identical card such that no number is repeated. If one card is picked at random, then what is the probability that the card drawn is a multiple of 2, 4 and 5?

- a. $\frac{1}{100}$ b. $\frac{1}{50}$

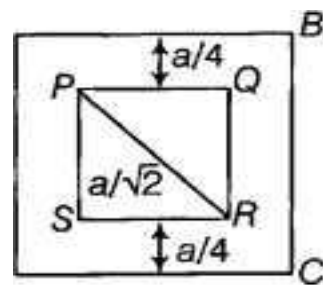
- c. $\frac{1}{20}$ d. $\frac{1}{5}$

19. In $\triangle ABC$, if $\angle A = 2\angle B$, then value of BC^2 is



- a. $AC(AC + AB)$
b. $AB(AC + AB)$
c. $AC + AB$
d. $2(AC + AB)$

20.



Given two squares $ABCD$ and $PQRS$ such that $PQRS$ is inscribed in $ABCD$. Then, the area of the above figure $ABCD$ is

- a. $\frac{a^2}{4}$ c. a^2
b. $2a^2$ d. $\frac{a^2}{2}$

21. Given that $\sin q = a/b$, then $\cos q$ is equal

to

- (A) $b / \sqrt{b^2 - a^2}$ (B) b/a
(C) $\sqrt{b^2 - a^2} / b^2$ (D) $a / \sqrt{b^2 - a^2}$

22. The value of the expression $\sin^2 22^\circ \sin^2 68^\circ / \cos^2 22^\circ \cos^2 68^\circ + \sin^2 63^\circ \cos^2 63^\circ \sin^2 27^\circ$ is

- (A) 3 (B) 2
(C) 1 (D) 0