# MATHS

# BOOKS - EDUCART PUBLICATION

# SAMPLE PAPER 7

## Section A

**1.** What is the sum of exponents of prime factors in the prime factorisation of 250.
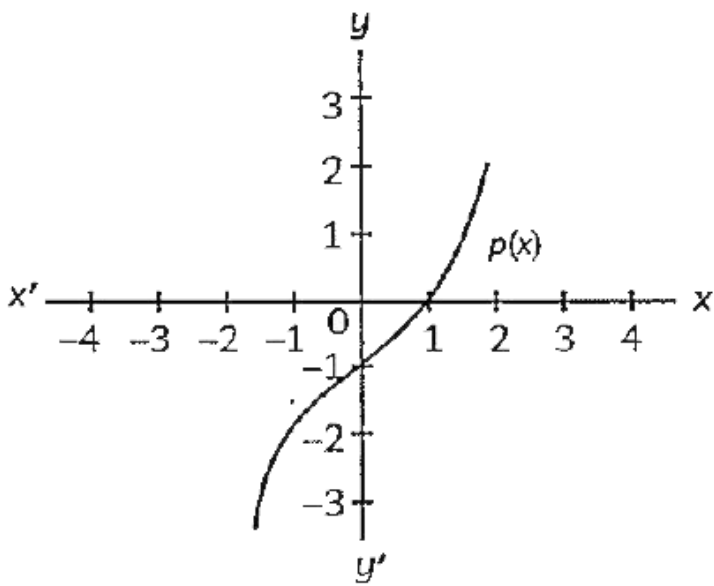
A. 4

B. 6

C. 8

D. 3

**Answer: A**

**2.** Find the number of zeroes, for the polynomial p(x) shown in the graph below:
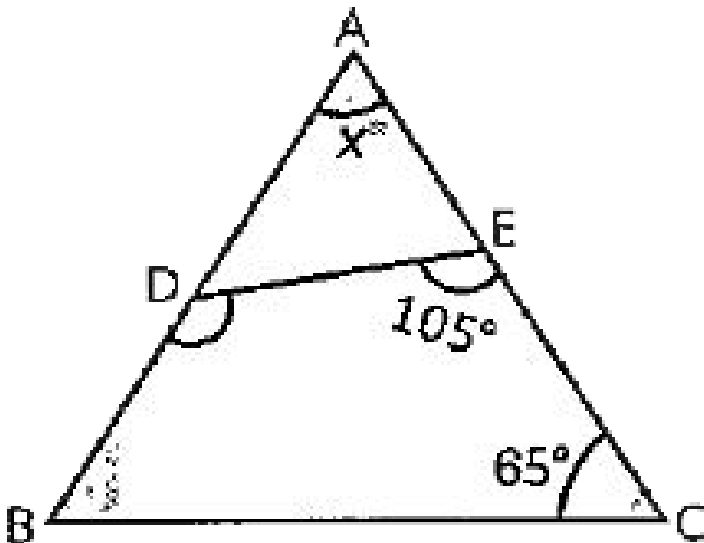
A. 0

B. 1

C. 2

D. 3

Answer: B

**3.** What is the value of x in the given figure, if

$\Delta ADE \sim \Delta ACB$, $\angle DEC = 105°$ and

$\angle ECB = 65°$

A. $45°$

B. $60°$

C. $13°$

D. $40°$

**Answer: D**

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**4.** What is the probability of choosing a vowel from the word MATCH if a letter is chosen randomly from it?

A. $\dfrac{2}{5}$

B. $\dfrac{1}{5}$

C. $\dfrac{3}{5}$

D. $\dfrac{4}{5}$

**Answer: B**

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**5.** An event is very unlikely to happen. Its probability is closet to

A. 0.1

B. 0.01

C. 0.001

D. 0.0001

**Answer: D**

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**6.** Calculate the value of 'K', if x = k is a solution of the quadratic polynomial $x^2 + 4x + 3$.
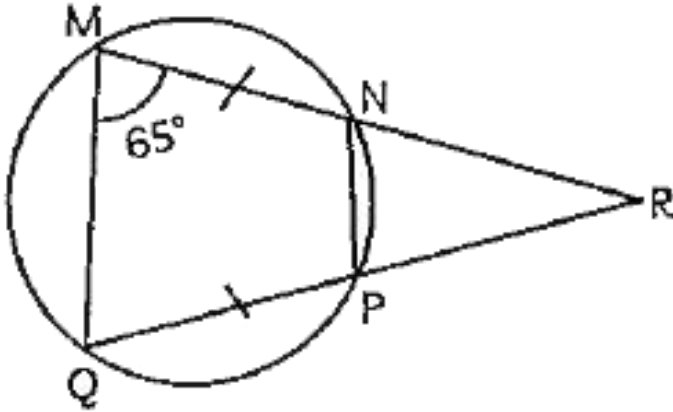
A. 1

B. $-1$

C. 3

D. $-4$

**Answer: B**

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**7.** As shown in the figure, MN = QP and on producing MN and QP, they intersect at R. If

MQ || NP and $\angle NMQ = 65°$, calculate $\angle R$.



A. $30°$

B. $25°$

C. $35°$

D. $50°$

**Answer: D**

**8.** Evaluate the least number which when divided by the numbers 18, 24, 30 and 42 leaves a remainder of 1.

A. 4221

B. 2521

C. 3862

D. 1221

**Answer: B**

**9.** What is the value of $\dfrac{\sin 45^\circ}{\sec 30^\circ + \cos ec30^\circ}$ ?

A. $\left(\sqrt{3} - 1\right)$

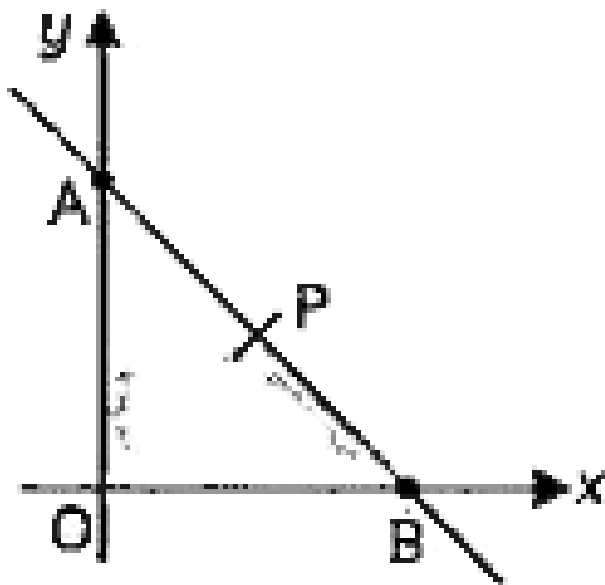B. $\dfrac{\sqrt{3}\left(\sqrt{3} - 1\right)}{4\sqrt{2}}$

C. $4\sqrt{2}$

D. $\sqrt{3}\left(\sqrt{3} - 1\right)$

**Answer: B**

**10.** In the figure P(3, 2) is the mid-point of the line segment AB. What are the co-ordinates of A and B respectively:



A. (4,0) and (6, 0)

B. (0,4) and (6,0)

C. (0,4) and (0,6)

D. (0,-4) and (-6, 0)

**Answer: B**

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**11.** From a well-shuffled deck of 52 playing cards, three cards ace, jack and queen of hearts are removed. One card is selected from

the remaining cards. What is the probability of getting a card of hearts?

A. $\dfrac{10}{49}$

B. $\dfrac{5}{49}$

C. $\dfrac{8}{49}$

D. $\dfrac{13}{49}$

**Answer: A**

**12.** If the point (5,0), (0, -2) and (3, 6) lie on the graph of a polynomial. Then, which of the following is a zero of the polynomial?

A. 5

B. 6

C. $-2$

D. not defined

**Answer: A**

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**13.** Evaluate measure of angle A, in $\triangle ABC$ which is right-angled at C and AC = 4 cm and AB = 8 cm.

    A. $30°$

    B. $45°$

    C. $60°$

    D. Cannot be determined

**Answer: C**

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**14.** Evaluate the area covered by hour hand in 1 hour, where the length of hour hand of clock is 7 cm.

**15.** The two zeroes of the polynomial p(x) =$4x^2$- 12x + 9 are:

A.

B.

C.

D.

**Answer: 3/2, 3/2`**

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**16.** After how many places will the decimal expansion of $\dfrac{189}{125}$ terminate?

A. 1 place

B. 2 place

C. 3 place

D. 4 place

**Answer: C**

**17.** The maximum number of students among who 1001 pens and 910 pencils can be distributed in such a way that each student gets same number of pens and same number of pencils is

A. 70

B. 93

C. 91

D. 82

**Answer: B**

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**18.** What is the value of $\beta - \alpha$ ,

if $\sin\alpha = \dfrac{\sqrt{3}}{2}$ and $\cos\beta = 0$

A. $0^\circ$

B. $30^\circ$

C. $45^\circ$

D. $60^\circ$

Answer: B

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**19.** What is the relation between x and y, if the point P(x, y) is equidistant from the points A(7,0) and B(0,5)?

A. $x + 2y = 9$

B. $7x - 5y = 12$

C. $5x + 2y = 15$

D. $3x - 2y = 7$

**Answer: B**

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**20.** Evaluate $0.\overline{68} + 0.\overline{73}$.

A. $1.\overline{31}$

B. $1.\overline{42}$

C. $1.\overline{21}$

D. $1.0\overline{1}$

**Answer: B**

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Section B

**1.** A pair of linear equations is said to be inconsistent if it has:

A. at least one solution

B. no solution

C. infinitely many solutions

D. unique solution

**Answer: B**

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**2.** Find the least number which is divisible by all numbers from 1 to 10 (both inclusive).

A. 2500

B. 2550

C. 2520

D. 3750

**Answer: C**

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**3.** If in triangles ABC and PQR, $\dfrac{AB}{PQ} = \dfrac{BC}{RP}$ then write the equality of angles of the two triangles such that two triangles are similar.

A. $\angle A = \angle$

B. $\angle B = \angle P$

C. $\angle C = \angle Q$

D. $\angle B = \angle Q$

**Answer: B**

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**4.** Evaluate the simplified value of $\left(1 + \cot^2 \theta\right)\left(1 - \cos \theta\right)\left(1 + \cos \theta\right)$.

A. 1

B. $-1$

C. $\cot \theta$

D. $\sec^2 \theta$

**Answer: A**

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**5.** Evaluate the radius of a circle, whose circumference is numerically equal to four times the area of the circle.

    A. 0.5 cm

    B. 4 cm

    C. 7 cm

    D. $\dfrac{22}{7} cm$

**Answer: A**

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**6.** Sakshi and Rashi wants to play the ludo. But beings kids, they are fighting with each other as who will start the game. Both of them want to throw the dice first. They found two coins and decided to toss them simultaneously to know who will start the game.



Sakshi says, 'If I get atleast one head, I will win and start the game. The probability that Sakshi will start the game is:

A. 1

B. $\dfrac{3}{4}$

C. $\dfrac{1}{4}$

D. $\dfrac{1}{2}$

**Answer: B**

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**7.** $\triangle ABC$ is an equilateral triangle of side 2a units. Find each of its altitudes.

A. $\sqrt{3}$ a units

B. $\dfrac{\sqrt{3}}{2}$ a units

C. $\dfrac{a}{\sqrt{2}}$ units

D. $\sqrt{2}$ a units

**Answer: A**

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**8.** A box contains 8 red pencils and some blue

pencils. If the probability of drawing a blue

pencil is three times of a red pencil, then the number of blue pencils in the bag are:

A. 36

B. 24

C. 18

D. 12

**Answer: B**

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**9.** What is the point of intersection of the lines

x-3 = 0 and y- 5 = 0?

A. (-3,5)

B. (-3,5)

C. (3,5)

D. (3,-5)

**Answer: C**

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**10.** Suppose $\vec{v} = 2\vec{i} + \vec{j} - \vec{k}$ and vecw = $\vec{i} + 3\vec{k}$
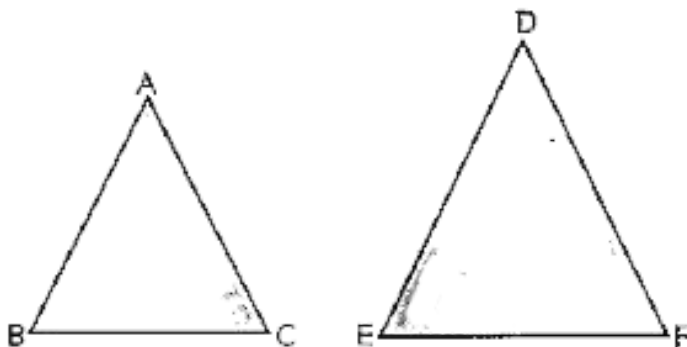
A. 81

B. 78

C. 57

D. 54

**Answer: A**

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**11.** Given two triangles ABC and DEF. If $\Delta ABC \backsim \Delta DEF$, $2AB = DE$ and BC = 8 cm, then find the length of EF.



A. 10cm

B. 12cm

C. 8cm

D. 16cm

**Answer: D**

**12.** If $\sin x + \cos y = 1$ ,$x = 30^0$ and y is an acute angle. Find the value of y

A. $30°$

B. $45°$

C. $60°$

D. $90°$

**Answer: C**

**13.** Find the value of $\dfrac{1}{\alpha} + \dfrac{1}{\beta}$ if $\alpha$ and $\beta$ are

the zeroes of the polynomial $x^2 + x + 1$.

A. 1

B. 0

C. $-1$

D. 2

**Answer: C**

14. The region enclosed by an arc and a chord

of a circle is called .............. of the circle.

    A. segment

    B. quadrant

    C. sector
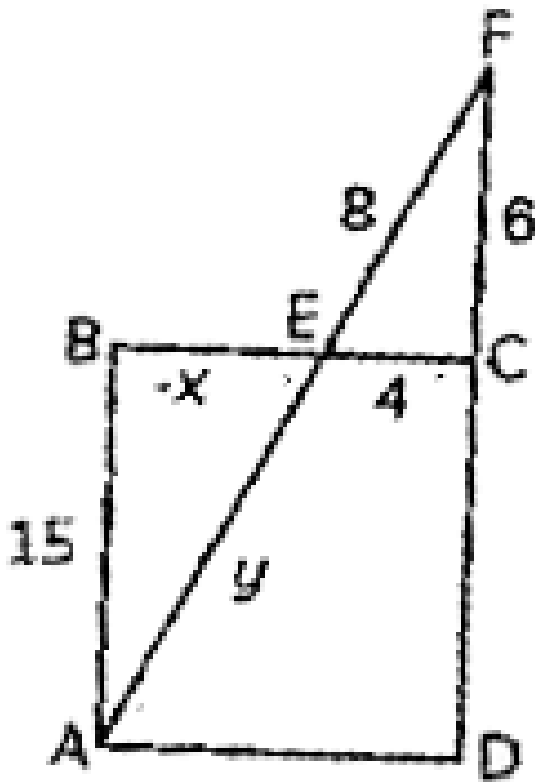
    D. area

**Answer: A**

**15.** In the given figure, Here, ABCD is a parallellogram in which DC is extended to F such that AF intersects BC at E.

Perimeter of $\triangle ABE =$

A. 35cm

B. 36cm

C. 40cm

D. 45cm

**Answer: D**

**16.** Evaluate the area of the largest circle that can be inscribed inside a rectangle of sides 7 cm and 3.5 cm.

A. $\frac{12}{7}cm^2$

B. $\frac{17}{7}cm^2$

C. $\dfrac{77}{8} cm^2$

D. $\dfrac{22}{7} cm^2$

**Answer: C**

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**17.** If x= 2 is a zero of polynomial $ax^2 - bx + 2$

then what is the relation between a and b?

A. 2a-b+ 1 = 0

B. a + b + 1 = 0

C. a-b+1 = 0

D. 7a-5b + 1 = 0

**Answer: A**

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**18.** Find the length of each side of a rhombus

whose diagonals are 24 cm and 10 m long.

A. 34cm

B. 26cm

C. 25cm

D. 13cm

**Answer: D**

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**19.** What is the length of side AC in $\triangle ABC$ which is right angled at B if BC = 5 cm and $\angle BAC = 30°$ ?

A. 5cm

B. 15cm

C. 10cm

D. 7cm

**Answer: C**

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**20.** A quadratic polynomial with zeroes -2 and

3, is:

A. $3x^2 - 2x + 6$

B. $2x^2 + 3x - 6$

C. $x^2 - 2x + 6$

D. $x^2 - x - 6$

**Answer: D**

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Section C

**1.** On Feb. 02, 2017, Verma purchased from

Sharma goods for Rs 17,500. Verma paid Rs

2,500 immediately and for the balance gave a promissory note to Sharma payable after 60 days. Sharma immediately endorsed the promissory note in favour of his creditor. Gupta for the full settlement of a debt of Rs 15,400. On the due date of the bill Gupta presented the bill to Verma which the latter dishonoured and Gupta paid Rs 5,000 noting charges. On the same date Gupta informed Sharma about the dishonour of the bill. Sharma settled his debt to Gupta by cheque for Rs 15,500 which includes noting charges and interest. Verma settled Sharma's claim by

cheque for the same amount. Record the necessary journal entries is the books of Sharma, Gupta and Verma for the above transaction and prepare Verma's and Gupta's accounts in the books of Sharma. Sharma's account in the books of Verma. And also Sharma's account in the books of Gupta.

A. 46 masks of type A, and 54 masks of type B

B. 54 masks of type A, and 46 masks of type B

C. 41 masks of type A, and 59 masks of type

B

D. 59 masks of type A, and 41 masks of type

B

Answer: D

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**2.** On Feb. 02, 2017, Verma purchased from

Sharma goods for Rs 17,500. Verma paid Rs

2,500 immediately and for the balance gave a

promissory note to Sharma payable after 60 days. Sharma immediately endorsed the promissory note in favour of his creditor. Gupta for the full settlement of a debt of Rs 15,400. On the due date of the bill Gupta presented the bill to Verma which the latter dishonoured and Gupta paid Rs 5,000 noting charges. On the same date Gupta informed Sharma about the dishonour of the bill. Sharma settled his debt to Gupta by cheque for Rs 15,500 which includes noting charges and interest. Verma settled Sharma's claim by cheque for the same amount. Record the

necessary journal entries is the books of Sharma, Gupta and Verma for the above transaction and prepare Verma's and Gupta's accounts in the books of Sharma. Sharma's account in the books of Verma. And also Sharma's account in the books of Gupta.

A. Rs.500

B. Rs.560

C. Rs.1050

D. Rs.1100

**Answer: D**

**3.** A resourceful home decorator manufactures two types of lamps say A and B. Both lamps go through two technician, first a cutter, second a finisher. Lamp A requires 2 hours of th cutters time and 1 hour of the finishers time. Lamp B requires 1 hour of cutters and 2 hours of finishers time. The cutter has 104 hours and finisher has 76 hours of time available each month. Profit o one lamp A is Rs. 6.00 and on one lamp B is Rs.11.00. Assuming that he can

sell all that he produces, how many of each

type of lamps should he manufacture to

obtain the best return.

A. 120 masks of type A, and 130 masks of

type B

B. 130 masks of type A, and 120 masks of

type B

C. 155 masks of type A, and 95 masks of

type B

D. 165 masks of type A, and 85 masks of

type B

**Answer: D**

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**4.** On Feb. 02, 2017, Verma purchased from

Sharma goods for Rs 17,500. Verma paid Rs

2,500 immediately and for the balance gave a

promissory note to Sharma payable after 60

days. Sharma immediately endorsed the

promissory note in favour of his creditor. Gupta for the full settlement of a debt of Rs 15,400. On the due date of the bill Gupta presented the bill to Verma which the latter dishonoured and Gupta paid Rs 5,000 noting charges. On the same date Gupta informed Sharma about the dishonour of the bill. Sharma settled his debt to Gupta by cheque for Rs 15,500 which includes noting charges and interest. Verma settled Sharma's claim by cheque for the same amount. Record the necessary journal entries is the books of Sharma, Gupta and Verma for the above

transaction and prepare Verma's and Gupta's accounts in the books of Sharma. Sharma's account in the books of Verma. And also Sharma's account in the books of Gupta.

A. Rs. 3000

B. Rs. 3052

C. Rs. 2941

D. Rs. 2938

Answer: A

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**5.** On Feb. 02, 2017, Verma purchased from Sharma goods for Rs 17,500. Verma paid Rs 2,500 immediately and for the balance gave a promissory note to Sharma payable after 60 days. Sharma immediately endorsed the promissory note in favour of his creditor. Gupta for the full settlement of a debt of Rs 15,400. On the due date of the bill Gupta presented the bill to Verma which the latter dishonoured and Gupta paid Rs 5,000 noting charges. On the same date Gupta informed

Sharma about the dishonour of the bill. Sharma settled his debt to Gupta by cheque for Rs 15,500 which includes noting charges and interest. Verma settled Sharma's claim by cheque for the same amount. Record the necessary journal entries is the books of Sharma, Gupta and Verma for the above transaction and prepare Verma's and Gupta's accounts in the books of Sharma. Sharma's account in the books of Verma. And also Sharma's account in the books of Gupta.

A. 200% in type A, and 100% in type B

B. 180% in type A and 110% in type B

C. 150% in type A and 120% in type B

D. 110% in type A and 180% in type B

Answer: B

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**6.** Statement-I : Graph (1) represent one dimensional motion of a particle. While graph (2) can not represent 1-D motion of the particle. (here x is position and t is time)

(1)

(2)
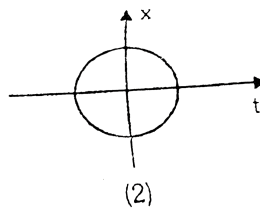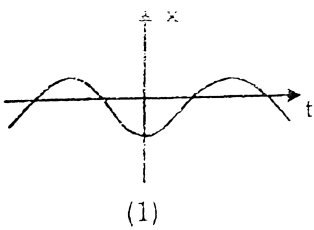
Statement-II : Particle can have only one position at an instant.
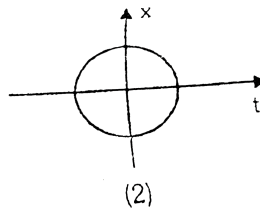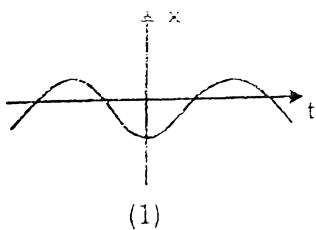
A. (5, 4)

B. (2,7)

C. (8,9)

D. (9,8)

Answer: A

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**7.** Statement-I : Graph (1) represent one dimensional motion of a particle. While graph (2) can not represent 1-D motion of the particle. (here x is position and t is time)



(1)

(2)

Statement-II : Particle can have only one position at an instant.

A. $\sqrt{53}$ units

B. $\sqrt{41}$ units

C. $\sqrt{72}$ units

D. $\sqrt{145}$ units

**Answer: C**

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**8.** Which of the following equation is best representation of given graph's?

A. (1,4)

B. (1,5)

C. (2,3)

D. (5, 1)

**Answer: B**

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**9.** Which of the following equation is best representation of given graph's?



A. $\sqrt{18}$ units

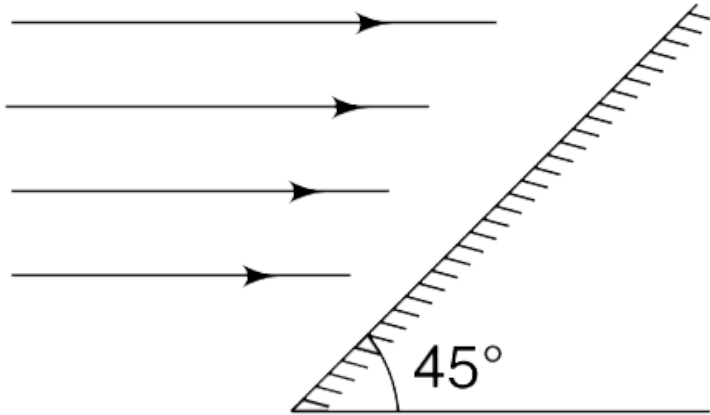B. $\sqrt{17}$ units

C. $\sqrt{5}$ units

D. $\sqrt{34}$ units

**Answer: A**

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**10.** A horizontal beam of light in incident on a plane mirror inclined at $45°$ to the horizontal. The percentage of light energy reflected from the mirror is $80\%$. Find the direction in which the mirror will experience

force due to the incident light.



A. $\sqrt{24}$ units

B. $\sqrt{17}$ units

C. $\sqrt{5}$ units

D. $\sqrt{26}$units

**Answer: D**

## Part A Section I

**1.** Two positive integers p and q are expressible as $p = a^3b$ and $q = ab^2$. Find the HCF (p,q) and LCM(p,q).

**2.** Is $-150$ a term of the A.P. $11,\ 8,\ 5,\ 2,$ ?

**3.** The roots of the equation $2x^2 - 6x + 3 = 0$ are

**4.** Find the solution of the pair of equations :

$2x + 3y = 9$

$3x + 4y = 5.$

**5.** Two vertices of a triangle are (4,-5) and (-5,-2). If the centroid of the triangle of the origin determine the third vertex of the triangle.
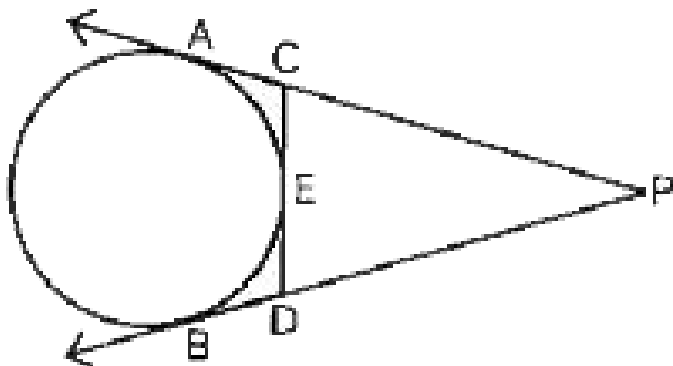
**6.** What is mid - point of line segment AB, where A (-5,0) and B(0,5) ?

**7.** In the adjoining figure, if PA=10 cm, then find the perimeter of $\triangle PCD$.

**8.** If $x\sec 45° = 2$, then what is the value of x.

**9.** If $\tan\theta + \cot\theta = 4$, then find the value of $\tan^4\theta + \cot^4\theta$.

**10.** Prove that : $\dfrac{\sin i}{1 + \cos i} = \dfrac{1 - \cos i}{\sin i}$

**11.** In an A.P., if a = 3.5, d = 0, n = 101, then find the value of $a_n$.

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**12.** If A=900, $\Sigma f_i d_l = -400$ and $\Sigma f_{i=100}$, then what is the value of $\bar{x}$ ?

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**13.** A 6 faced cube has letters A,B,C,D,A and C on its six faces. This cube is rolled once. What is the probability of getting B or C ?
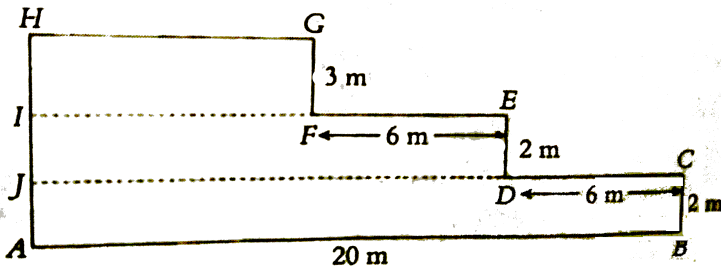
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**14.** A letter is chosen from letters of the word MAINTENANCE. What is the probability that it is N ?

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**15.** Find the area of figure given below.

**16.** If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then find the value of 'k'.

**17.** Examine if 1 and 2 are zeros of the polynomial $p(x) = x^3 - 3x^2 - x + 3$.

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**18.** Which term of the A.P. -2,-7,-12, . . . will be -77 ?

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**19.** What type of lines are represented by the pair of equations :

$10x + 6y = 9$ and $5x + 3y + 4 = 0$ ?

**20.** If an event is sure to occur, then what is its probability of occurrence ?

**21.** The decimal expansion of the rational number $\dfrac{14587}{1250}$ will terminate after:

**22.** Write a prime number greater than 91 but less than 100.

**23.** Find a zero of the polynomial

$$x^3 - 8$$

**24.** Write a quadratic polynomial whose sum of zeros is $\left(-\dfrac{1}{4}\right)$ and product of zeros is $\left(\dfrac{1}{4}\right)$

**25.** Determine the roots of the equation $\sqrt{3}x^2 - 2x - \sqrt{3} = 0$

**26.** Find the $15^{th}$ term of the AP,

$x - 7, x - 2, x + 3. \ldots$

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**27.** Find The discriminant of the equation

$(x + 1)^3 = 4 - x + x^3$

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**28.** Write the next term of the A.P :

$$3, 3 + \sqrt{2}, 3 + 2\sqrt{2}, 3 + 3\sqrt{2} \ldots$$

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**29.** Solve for x and y:

x + 2y = 9

2x - y = 8

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**30.** Obtain the condition for the points $(a, 0)$, $(0, b)$ and $(1, 1)$ to be collinear.

**31.** Find the coordinates of a point on y-axis which is equidistant from the points $(6, 5)$ and $(-4, 3)$

**32.** State the ASA criterion of similarity of triangles.

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**33.** Determine the length of the altitude of an isosceles triangle of sides 6 cm, 6 cm and 4 cm.

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**34.** Draw a circle and two lines parallel to a given line such that one is a tangent and the other, a secant to the circle.

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**35.** Draw a line segment of length 8 cm and divides it in the ratio $2 : 3$

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**36.** From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. Find the radius of the circle.

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**37.** If 3cos A = 1, then find the value of cosec A.

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**38.** Show that, $\dfrac{1 + \tan^2 \theta}{1 + \cot^2 \theta} = \tan^2 \theta$

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**39.** Find the perimeter of a quadrant of a circle of radius 'r'.

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**40.** Find the total surface area of a quadrant of a sphere of radius 'r'

**41.** Find the probability of drawing a green coloured ball from a bag containing 6 red and 5 black balls.

**42.** Find the median of the first 50 even natural numbers.

1. A ladder is resting with one end is contact with the top of a wall of height 60 m and the other end on the ground is at a distance of 11 m form the wall. The length of the ladder is :

    A. 18 m

    B. 20 m

    C. 21 m

    D. 22 m

**Answer: C**

**2.** Unthickened area in secondary wall is called

A. 5.25 sq m

B. 4.5 sq m

C. 5 sq m

D. 5.5 sq m

**Answer: A**

**3.** The cost of levelling a square lawn at Rs 15 per square metre is Rs 19,935. Find the cost of fencing the lawn at Rs 22 per metre.

A. Rs. 575

B. Rs. 450

C. Rs. 525

D. Rs. 550

**Answer: C**

**4.** The cost of 3 pens is Rs. 30, then the cost of

2 pens is Rs. 20.

    A. Rs. 2800

    B. Rs. 2660

    C. Rs. 2521

    D. Rs. 2638

**Answer: D**

▶

**5.** Area of circular garden with diameter 8 m is

    A. 5.22 sq m

    B. 11.5 sq m

    C. 18.84 sq m

    D. 24.11 sq m

**Answer: A**

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## 6. Stationary sound 'S' of frequency 334 Hz and a stationary observer 'O' are placed near a reflecting surface moving away from the source with velocity 2 m/s the apparent frequency of the echo of S considering velocity of sound equal to 334 m/s is

` (##TRG_PHY_MCQ_XII_C07_E04_015_Q01.png" width="80%">

A. 8

B. 6

C. 5

D. 4

**Answer: B**

7. Stationary sound 'S' of frequency 334 Hz and a stationary observer 'O' are placed near a reflecting surface moving away from the source with velocity 2 m/s the apparent frequency of the echo of S considering velocity of sound equal to 334 m/s is

` (##TRG_PHY_MCQ_XII_C07_E04_015_Q01.png"

width="80%">

A. 14 cm $\times$ 14 cm $\times$ 3 cm

B. 18 cm $\times$ 18 cm $\times$ 1 cm

C. 12 cm $\times$ 12 cm $\times$ 4 cm

D. 8 cm $\times$ 8 cm $\times$ 8 cm

**Answer: A**

**8.** If $y = \tan^{-1}(\sec x - \tan x),$ then differentiation of y wrt x is equal to= ?

A. 14 cm $\times$ 14 cm $\times$ 3 cm

B. 18 cm $\times$ 18 cm $\times$ 1 cm

C. 12 cm $\times$ 12 cm $\times$ 4 cm

D. 8 cm $\times$ 8 cm $\times$ 8 cm

Answer: B

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**9.** The length and breadth of a rectangular sheet of paper are 60 cm and 30 cm, respectively. A square of side 5 cm is cut and removed from the four corners of the sheet. The rest of the paper is folded to form a cuboid (without the top face). Find the volume of the cuboid so formed (in $cm^3$).

A. $4x^3 + 80x^2 - 400x$

B. $400x + 4x^3 - 80x^2$

C. $4x^3 + 80x^2 + 400x$

D. $400 + 4x^3 - 80x^2$

**Answer: B**

**10.** Stationary sound 'S' of frequency 334 Hz and a stationary observer 'O' are placed near a reflecting surface moving away from the source with velocity 2 m/s the apparent frequency of the echo of S considering velocity of sound equal to 334 m/s is
` (##TRG_PHY_MCQ_XII_C07_E04_015_Q01.png" width="80%">

A. 10

B. 16

C. 21

D. infinite number

**Answer: D**

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**11.** The students of a shool decided to beautifly the school on the annual day by fixing colourful flags on the straight passage of the

school. They have 27 flags to be fixed at intervals of every 2 m. The flags are stored at the position of the middle most flag. Ruchi was given the responsibility of placing the flags.

Ruchi kept her books where the flags wer stored. She could carry only one flag at a time. How much distance she did cover in completing this job and returning back to collect her books ? What is the maximum distance she travelled carrying a flag ?

A. $12^{th}$

B. $13^{Th}$

C. $14^{th}$

D. $15^{th}$

**Answer: C**

▶ **Watch Video Solution**

**12.** The students of a shool decided to beautifly the school on the annual day by fixing colourful flags on the straight passage of the school. They have 27 flags to be fixed at

intervals of every 2 m. The flags are stored at the position of the middle most flag. Ruchi was given the responsibility of placing the flags.

Ruchi kept her books where the flags wer stored. She could carry only one flag at a time. How much distance she did cover in completing this job and returning back to collect her books ? What is the maximum distance she travelled carrying a flag ?

A. 188 m

B. 286 m

C. 314 m

D. 364 m

**Answer: D**

▶ **Watch Video Solution**

**13.** The students of a shool decided to beautifly the school on the annual day by fixing colourful flags on the straight passage of the school. They have 27 flags to be fixed at intervals of every 2 m. The flags are stored at

the position of the middle most flag. Ruchi was given the responsibility of placing the flags.

Ruchi kept her books where the flags wer stored. She could carry only one flag at a time. How much distance she did cover in completing this job and returning back to collect her books ? What is the maximum distance she travelled carrying a flag ?

A. 628 m

B. 728 m

C. 572 m

D. 276 m

**Answer: B**

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**14.** The students of a shool decided to beautifly the school on the annual day by fixing colourful flags on the straight passage of the school. They have 27 flags to be fixed at intervals of every 2 m. The flags are stored at the position of the middle most flag. Ruchi

was given the responsibility of placing the flags.

Ruchi kept her books where the flags wer stored. She could carry only one flag at a time. How much distance she did cover in completing this job and returning back to collect her books ? What is the maximum distance she travelled carrying a flag ?

A. 22 m

B. 24 m

C. 26 m

D. 28 m

**Answer: C**


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**15.** The students of a shool decided to beautifly the school on the annual day by fixing colourful flags on the straight passage of the school. They have 27 flags to be fixed at intervals of every 2 m. The flags are stored at the position of the middle most flag. Ruchi

was given the responsibility of placing the flags.

Ruchi kept her books where the flags wer stored. She could carry only one flag at a time. How much distance she did cover in completing this job and returning back to collect her books ? What is the maximum distance she travelled carrying a flag ?
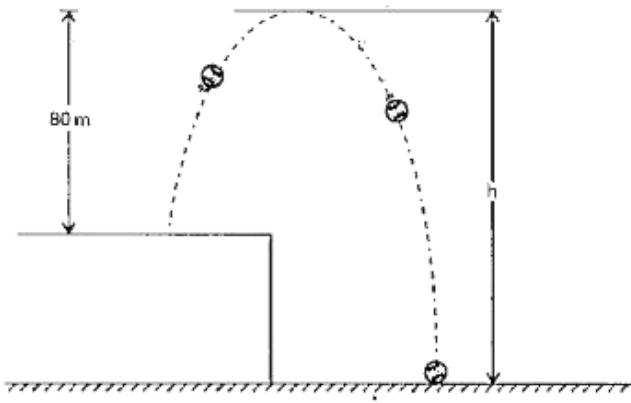
A. Rs. 575

B. Rs. 390

C. Rs. 780

D. Rs. 810

**Answer: D**

▶ **Watch Video Solution**

**16.** Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is 'h', which is given by $h = -16t^2 + 64t + 80$
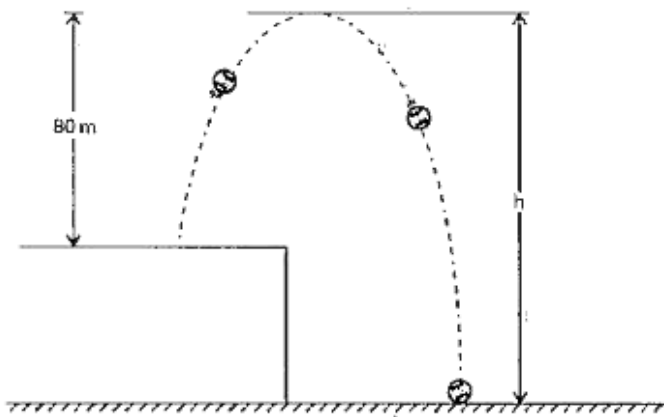
What is the height reached by the ball after 1 second ?

A. 135 m

B. 140 m

C. 128 m

D. 145 m

**Answer: C**

**17.** Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is 'h', which is given by $h = -16t^2 + 64t + 80$

What is the maximum height reached by the ball ?
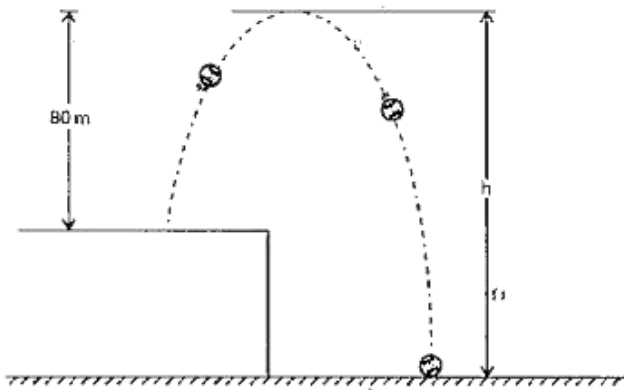
A. 154 m

B. 144 m

C. 136 m

D. 158 m

**Answer: B**

**18.** Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is 'h', which is given by $h = -16t^2 + 64t + 80$



How long will the ball take to hit the ground ?

A. 4 seconds
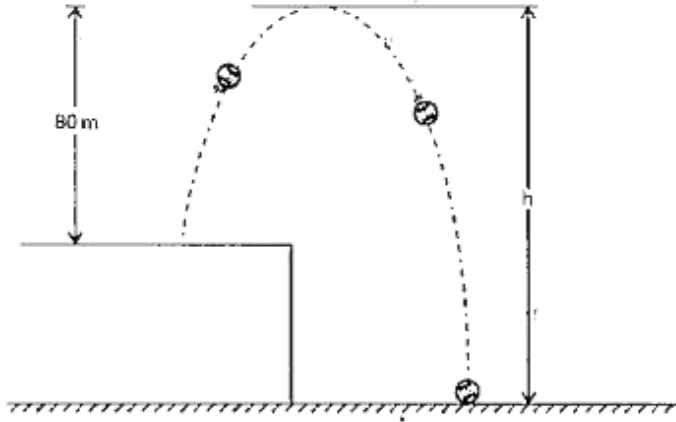
B. 3 seconds

C. 5 seconds

D. 6 seconds

**Answer: C**

▶ **Watch Video Solution**

**19.** Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is

'h', which is given by $h = -16t^2 + 64t + 80$



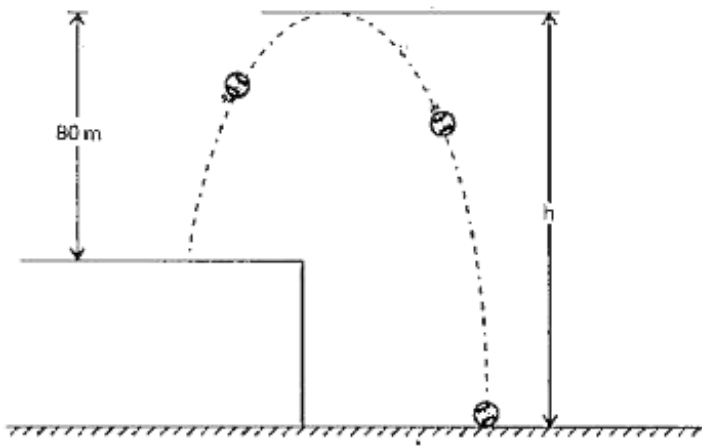What are the two possible times to reach the ball at the same height of 128 m ?

A. 1 and 3 seconds

B. 1.5 and 2.5 seconds

C. 0.5 and 2.5 seconds

D. 1.6 and 2.6 seconds

**Answer: A**

**20.** Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is 'h', which is given by $h = -16t^2 + 64t + 80$

After 6 seconds, where is the ball ?

A. At the ground

B. rebounds

C. at highest point

D. fall back

Answer: B

**21.** Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward.

The more TV's you manufacture in a single run, lower the costs per unit, which in turn increases your bottom-line margins.

Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000 sets in the 6th year and 11,300 sets in the 9th year.

On the basis of the above information, answer any four of the following questions:

The company's production of the first year is:

A. 2000

B. 2500

C. 3000

D. 5000

**Answer: B**

▶ **Watch Video Solution**

22. Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness

can be its own reward.

The more TV's you manufacture in a single run, lower the costs per unit, which in turn increases your bottom-line margins.



Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000 sets in the 6th year and 11,300

sets in the 9th year.

The company's production of the 8th year is:

A. 9600

B. 9800

C. 10200

D. 10500

**Answer: C**

▶ **Watch Video Solution**

**23.** Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward.

The more TV's you manufacture in a single run, lower the costs per unit, which in turn increases your bottom-line margins.

Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000 sets in the 6th year and 11,300 sets in the 9th year.

The company's total production of the first 6 years is:

A. 28950

B. 30150

C. 30250

D. 31500

**Answer: D**

▶ **Watch Video Solution**

**24.** Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward.

The more TV's you manufacture in a single run, lower the costs per unit, which in turn

increases your bottom-line margins.



Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000 sets in the 6th year and 11,300 sets in the 9th year.

The company's production increases every year by:

A. 2500

B. 2200

C. 1800

D. 1100

**Answer: D**

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**25.** Satellite TV manufacturing businesses tend to have what economists call "economies of scale." When economies of scale exist, bigness can be its own reward.

The more TV's you manufacture in a single run, lower the costs per unit, which in turn increases your bottom-line margins.

Keeping that in mind, a T.V. manufacturing company increases its production uniformly by fixed number every year. The company produces 8000 sets in the 6th year and 11,300 sets in the 9th year.

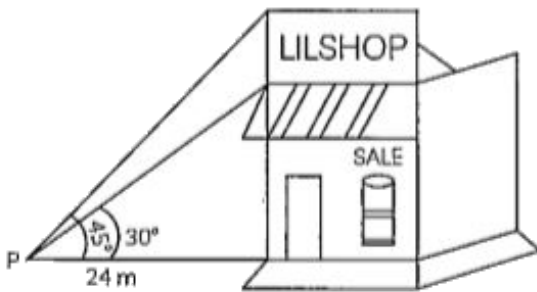In which year the company's production is 9100 sets ?

A. $5^{th}$

B. $6^{th}$

C. $7^{th}$

D. $9^{th}$

**Answer: C**

**26.** Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.

From a point P on the ground level, the angle of elevation of the roof of the building is $30°$ and the angle of elevation of the top of the sign board is $45°$. The point P is at a distance of 24 m from the base of the building.

The height of the building (without the sign board) is
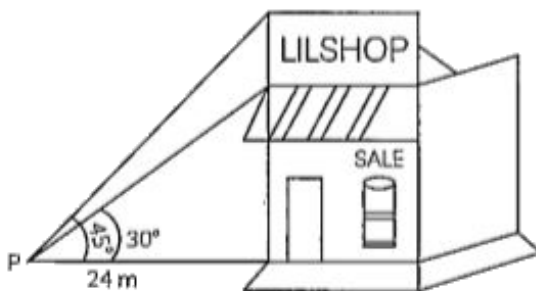
A. 11 m

B. 14 m

C. 17 m

D. 22 m

**Answer: B**

▶ **Watch Video Solution**

**27.** Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.

From a point P on the ground level, the angle

of elevation of the roof of the building is $30°$

and the angle of elevation of the top of the

sign board is $45°$. The point P is at a distance

of 24 m from the base of the building.

The height of the building (with the sign

board) is

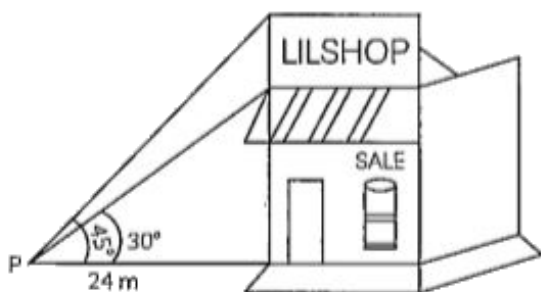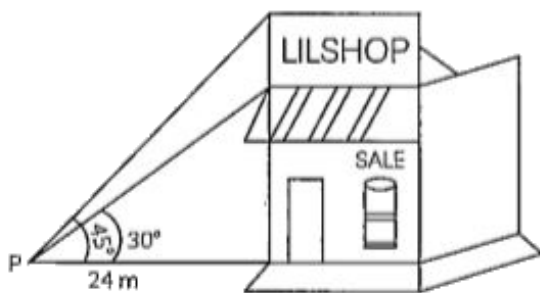A. $24\sqrt{3}$ m

B. $24\sqrt{2}$ m

C. 24 m

D. 12 m

Answer: C


Watch Video Solution

**28.** Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.

From a point P on the ground level, the angle

of elevation of the roof of the building is $30°$

and the angle of elevation of the top of the

sign board is $45°$. The point P is at a distance

of 24 m from the base of the building.

The height of the sign board is

A. $\left(24\sqrt{3} - 11\right)$ m

B. $\left(24 - 8\sqrt{3}\right)$ m

C. 15 m

D. 10 m

**Answer: D**

**29.** Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.

From a point P on the ground level, the angle

of elevation of the roof of the building is $30°$

and the angle of elevation of the top of the

sign board is $45°$. The point P is at a distance

of 24 m from the base of the building.

On the basis of the above information, answer any four of the following questions:

The distance of the point P from the top of the sign board, is
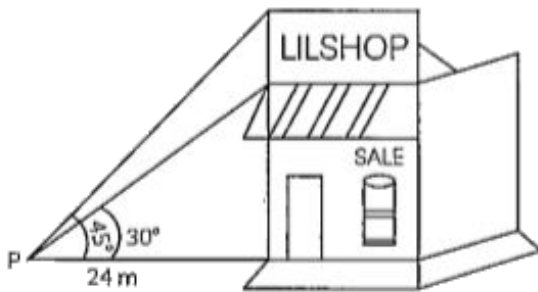
A. $24\sqrt{3}$ m

B. $24\sqrt{2}$ m

C. 24 m

D. 12 m

**Answer: B**

**30.** Eshan purchased a new building for her business. Being in the prime location, she decided to make some more money by putting up an advertisement sign for a rental ad income on the roof of the building.

From a point P on the ground level, the angle

of elevation of the roof of the building is $30°$

and the angle of elevation of the top of the

sign board is $45°$. The point P is at a distance

of 24 m from the base of the building.

If the point of observation P is moved 10 m towards the base of the building, then the angle of elevation $\theta$ of the roof of the building is given by

A. $\tan \theta = \sqrt{3}$

B. $\tan \theta = \dfrac{2}{\sqrt{3}}$

C. $\tan \theta = \dfrac{1}{2}$

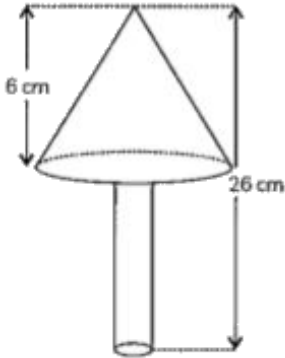D. $\tan \theta = \dfrac{4\sqrt{3}}{7}$

**Answer: D**

**31.** In a toys manufacturing company, wooden parts are assembled and painted to prepare a toy. One specific toy is in the shape of a cone mounted on a cylinder.

For the wood processing activity center, the wood is taken out of storage to be sawed, after which it undergoes rough polishing, then is cut, drilled and has holes punched in it. It is then fine polished using sandpaper.

6 cm

26 cm

For the retail packaging and delivery activity

center, the polished wood sub-parts are

assembled together, then decorated using

paint.

The total height of the toy is 26 cm and the

height of its conical part is 6 cm. The

diameters of the base of the conical part is 5

cm and that of the cylindrical part is 4 cm.

If its cylindrical part is to be painted yellow,

the surface area need to be painted is

A. $80\pi$ sq cm
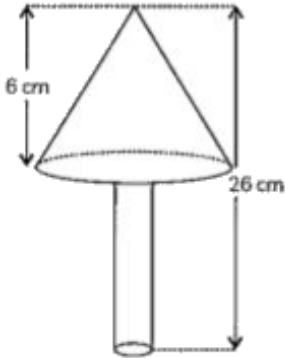
B. $82\pi$ sq cm

C. $84\pi$ sq cm

D. $88\pi$ sq cm

**Answer: C**

**32.** In a toys manufacturing company, wooden parts are assembled and painted to prepare a toy. One specific toy is in the shape of a cone mounted on a cylinder.

For the wood processing activity center, the wood is taken out of storage to be sawed, after which it undergoes rough polishing, then is cut, drilled and has holes punched in it. It is then fine polished using sandpaper.

6 cm

26 cm

For the retail packaging and delivery activity center, the polished wood sub-parts are assembled together, then decorated using paint.

The total height of the toy is 26 cm and the height of its conical part is 6 cm. The

diameters of the base of the conical part is 5 cm and that of the cylindrical part is 4 cm.

If its conical part is to be painted green, the surface area need to be painted is

A. $26.6\pi$ sq cm

B. $22.5\pi$ sq cm

C. $20.5\pi$ sq cm

D. $18.5\pi$ sq cm

**Answer: D**

**33.** In a toys manufacturing company, wooden parts are assembled and painted to prepare a toy. One specific toy is in the shape of a cone mounted on a cylinder.

For the wood processing activity center, the wood is taken out of storage to be sawed, after which it undergoes rough polishing, then is cut, drilled and has holes punched in it. It is then fine polished using sandpaper.

6 cm
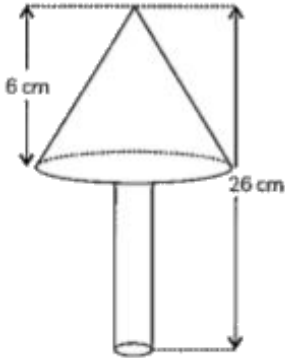
26 cm

For the retail packaging and delivery activity center, the polished wood sub-parts are assembled together, then decorated using paint.

The total height of the toy is 26 cm and the height of its conical part is 6 cm. The

diameters of the base of the conical part is 5 cm and that of the cylindrical part is 4 cm.

The volume of the wood used in making this toy, is

A. $92.5\pi$ sq cm

B. $89.5\pi$ sq cm

C. $85.5\pi$ sq cm

D. $72.5\pi$ sq cm

**Answer: A**

**34.** A wooden toy rocket is in the shape of a cone mounted on a cylinder. The height of the entire rocket is 26 cm, while the height of the conical part is 6 cm. The base of the conical portion has a diameter of 5 cm, while the base diameter of the cy

A. 10

B. 9.65

C. 9.84

D. 10.25

**Answer: B**

**35.** In a certain code language, 'hope to see you' is coded as 're so na di', 'please come to see the party' is coded as 'fi ge na di ke zo', 'hope to come' is coded as 'di so ge' and 'see you the party' is coded as 're fi zo na'

How is 'party' coded in the given code language ?

A. 1900

B. 1869

C. 1833

D. 1805

**Answer: C**

 **Watch Video Solution**

**36.** As part of the 'Swachh Bharat Abhyan', some houses of a locality in Agra decided to clean up and beautify a Primary School of their locality by planting a number of plants. They involved the school kids and the local community in doing so.



Here is the data indicating the number of plants contributed by different houses:

| Number of plants contributed | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 |
|---|---|---|---|---|---|---|
| Number of houses | 10 | 8 | x | 7 | 12 | 4 |

If the mean number of plants contributed be 8.9, then how many houses contributed 7 to 9 plants?

A. 6 houses

B. 7 houses

C. 8 houses

D. 9 houses

Answer: D

**37.** As part of the 'Swachh Bharat Abhyan', some houses of a locality in Agra decided to clean up and beautify a Primary School of their locality by planting a number of plants. They involved the school kids and the local community in doing so.

Here is the data indicating the number of plants contributed by different houses:

| Number of plants contributed | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 |
|---|---|---|---|---|---|---|
| Number of houses | 10 | 8 | x | 7 | 12 | 4 |

9 houses contributed 7 to 9 plants. How many houses of the locality came forward to beautify the primary school?

A. 50 houses

B. 49 houses

C. 48 houses

D. 47 houses

**Answer: A**

**38.** As part of the 'Swachh Bharat Abhyan', some houses of a locality in Agra decided to clean up and beautify a Primary School of their locality by planting a number of plants. They involved the school kids and the local community in doing so.

Here is the data indicating the number of plants contributed by different houses:

| Number of plants contributed | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 |
|---|---|---|---|---|---|---|
| Number of houses | 10 | 8 | x | 7 | 12 | 4 |

On the basis of the above information, answer any four of the following questions:

The mode of the frequency distribution is

A. 11.5

B. 12.65

C. 13.25

D. 13.65

Answer: D

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**39.** If
$\sin 3\theta = \cos(\theta - 6°)$, where $3\theta$ and $(\theta - 6°)$ are acute angle then the value of $\theta$ is
_____.

A. 9.77

B. 10.48

C. 10.35

D. 10.15

**Answer: B**

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**40.** As part of the 'Swachh Bharat Abhyan', some houses of a locality in Agra decided to clean up and beautify a Primary School of their

locality by planting a number of plants. They involved the school kids and the local community in doing so.



Here is the data indicating the number of plants contributed by different houses:

| Number of plants contributed | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 |
|---|---|---|---|---|---|---|
| Number of houses | 10 | 8 | x | 7 | 12 | 4 |

The median class of the frequency distribution is

A. 3.5-6.5

B. 6.5-9.5

C. 9.5-12.5

D. 12.5-15.5

**Answer: B**

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Part B Section Iii

**1.** Assuming that $\sqrt{2}$ is irrational, show that $5 + \sqrt{2}$ is an irrational number.

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**2.** Find the greatest number that divides 45 and 240 completely.

▶ **Watch Video Solution**

**3.** If $x = a\cos^3\theta$ and $y = b\sin^3\theta$, prove that $\left(\dfrac{x}{a}\right)^{2/3} + \left(\dfrac{y}{b}\right)^{2/3} = 1.$

▶ **Watch Video Solution**

**4.** Prove: $\sqrt{\sec^2\theta + \cos ec^2\theta} = \tan\theta + \cot\theta.$

▶ **Watch Video Solution**

**5.** The largest possible sphere is carved out of wooden solid cube of side 7 cm. What s the

radius of this sphere ?

**6.** A solid cuboid with dimensions 18 cm $\times$ 12 cm $\times$ 8 cm is melted and turned into a cube. What is the length of its edge ?

**7.** A line intersects the y-axis and x-axis at the points P and Q respectively. If (2,-5) is the mid-

point of PQ then find the coordinates of P and Q.

**8.** A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from the base of the wall.

**9.** Write the prime factorisation of 8190.

**10.** Find the HCF of 2205, 5145 and 4410.

**11.** If $\alpha$ and $\beta$ be the roots of the equation $x^2 - 1 = 0$, then show that.

$$\alpha + \beta = \frac{1}{\alpha} + \frac{1}{\beta}$$

**12.** If Q (0, 1) is equidistant from P(5, -3) and R (x, 6), find the values of 'x'. Also, find the distances of QR and PR.

**13.** Find the ratio in which P(4,p) divides the line segment joining the points A(2, 3) and B(6, 3). Hence find the value of p.

**14.** If $\sin A = \dfrac{2mn}{m^2 + n^2}$, then find the value of $\dfrac{\sin A \cot A}{\cos A}$

**15.** The area of a sector of a circle of radius 36 cm is $54\,\pi$ sq cm. Find the length of the corresponding arc of the sector.

**16.** Find the mode of the following frequency distribution:

| Class | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 |
|---|---|---|---|---|---|---|
| Frequency | 3 | 8 | 9 | 10 | 3 | 2 |

> ▶ **Watch Video Solution**

**Part B Section Iv**

**1.** Solve for x and y :

$$x + \frac{y}{4} = 11, \qquad \frac{5x}{6} - \frac{y}{3} = 7$$

**2.** A 2-digit number is such that the product of the digit is 20. If 9 is subtracted from the number, the digits interchange their places. Find the number.

**3.** $\triangle$ ABC with vertices A(0-2,0),B(2,0) and C(0,2) is similar to $\triangle$ DEF with vertices
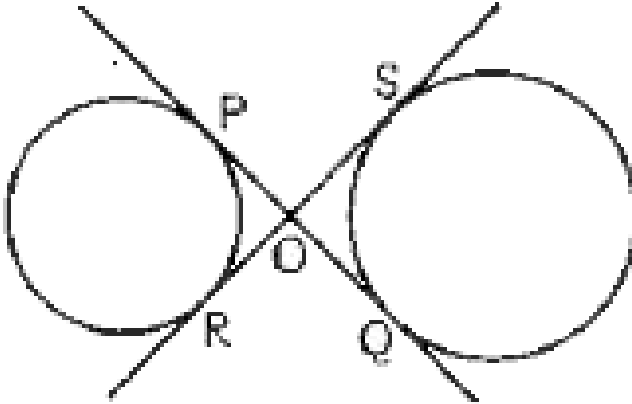
D(-4,0) ,E(4,0) and F(0,4).

**4.** Prove that the lengths of tangents drawn from an external point to a circle are equal.

**5.** In the figure, PQ and RS are the common tangents to two circles intersecting at O.

Prove that PQ=RS

**6.** Two concentric circles with radius 3 cm and 9.25 cm. Find the length of the chord of the bigger circle which is tangent to the other circle.

**7.** A number x is selected from the numbers 1,2,3 and then a second number y is randomly selected from the numbers 1,4,9. What is the probability that the product xy of the two numbers will be less than 9?

**8.** Find the value of :

$$\frac{5\sin^3 30° + \cos^2 45° - 4\tan^2 30°}{2\sin 30°.\cos 30° + \tan 45°} + \cos 0°$$

**9.** The first and the last terms of an A.P. are 17 and 350 respectively. If the common difference is 9, then how terms are there in the A.P. ?

**10.** Prove that $2\sqrt{3} - 4$ is an irrational number, using the fact that $\sqrt{3}$ is an irrational number.

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**11.** The sum of two numbers, as well as, the difference of their squares is 9. Find the numbers.

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**12.** Find the values of k for which the following equations have an infinite number of solutions: 2x + 3y =7 , (k-1)x+(k+2)y=3k

**13.** $\triangle$ ABC with vertices A(0-2,0),B(2,0) and C(0,2) is similar to $\triangle$ DEF with vertices D(-4,0) ,E(4,0) and F(0,4).

**14.** Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.

**15.** From a point P, two tangents PT and PS are drawn to a circle with centre O such that $\angle SPT = 120°$ Prove that OP = 2PS.
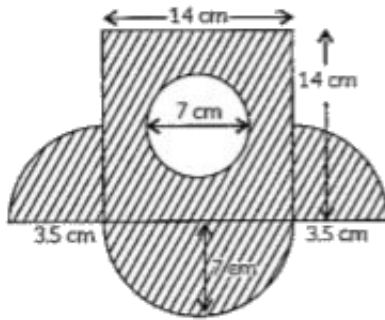
**16.** A cylindrical bucket, 32 cm high and with radius of base 18 cm, is filled with sand. This bucket is emptied out on the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, find the radius and slant height of the heap.

**17.** Find the area of the shaded region (use $\pi = \dfrac{22}{7}$)

**18.** Find out area of triangle OAB and BCD shown in figure :-

**1.** From the top of a building AB, 60 metres hight, the angles of depression of the top and bottom of a vertical lamp post CD are observed to be $30°$ and $60°$, respectively. Find

(i) the horizontal distance between AB and CD.

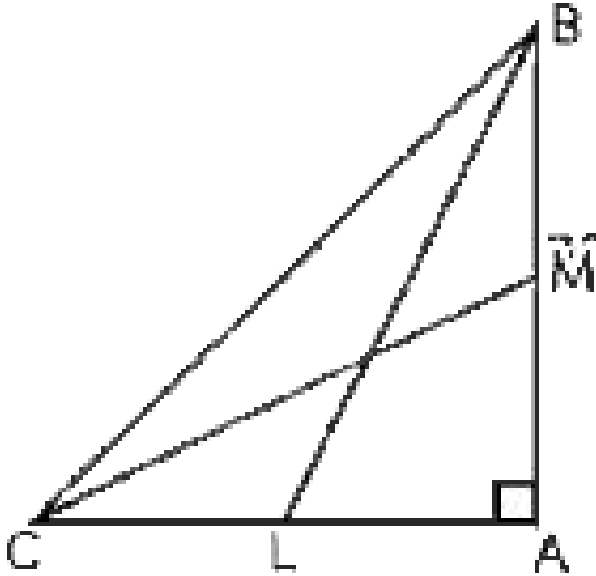(ii) the height of the lamp post.

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**2.** Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

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**3.** BL and CM are medians of $\triangle ABC$, right - angled a A.

Prove that $4\left(BL^2 + CM^2\right) = 5\ BC^2$

**4.** Find the median marks for the following frequency distribution :

| Marks | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 |
|---|---|---|---|---|---|
| Number of Students | 7 | 12 | 23 | 18 | 10 |

**5.** The angle of elevation of the top of a building from the foot of the tower is $30°$ and the angle of elevation of the top of tower from the foot of the building is $60°$,If the tower is 50 m high, find the height of the building.

**6.** If $\tan\theta + \sin\theta = m$ and $\tan\theta - \sin\theta = n$, show that $m^2 - n^2 4\sqrt{mm}$
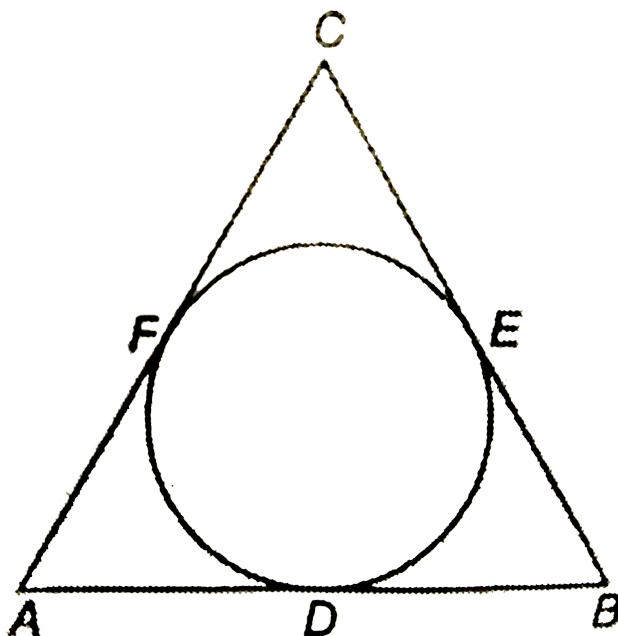
**7.** A circle is inscribed in a $\triangle ABC$ having sides 8 cm, 10 cm and 12 cm as shown in figure.

Find AD, BE and CF.

**8.** The 6th term of an AP is five times the 1st term and the 11th term exceeds twice the 5th

term by 3. Find the 8th term of the AP.

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