



केवल मूल्यांकनकर्ता के उपयोग हेतु!

माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

32 पृष्ठीय

विषय: Subject:

Mathematics

विषय कोड Subject Code:

1100

परीक्षा की तिथि / Date of Exam

110323

उत्तर देने का माध्यम

Medium of answering the paper:

English

प्रश्न पत्र का सेट

Set of the Question paper: D

गोले भरने से बचाव हेतु
सही तरीका

● ○ ○ ○

गलत तरीका

✗ ○ ○ ○ ○

नोट :-

इस रीट को के पूरे इस
पत्र के पीछे पर बचाव हेतु
को दें

कामगार/उपस्थान के लिए

ID NO

2698969

SUB.

100 - MATHEMATIC

Med.

ENGLISH

Reg.

01002195

केवल परीक्षक द्वारा भरा जावे।

प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टि करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक
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कुल प्राप्तांक शब्दों में	कुल प्राप्तांक अंकों में

परीक्षक एवं उपमुख्य परीक्षक

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

प्रमाणित किया जाता है कि अन्दर के पृष्ठों के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टि एवं अंकों का योग सही है।

निर्धारित मुद्रा : नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित संस्था के नाम की मुद्रा लगाएं।

उप मुख्य परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा

परीक्षक के हस्ताक्षर एवं निर्धारित मुद्रा

H.M.
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Solution of Q1

(i)

$$\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

(ii)

$$ax^2 + bx + c = 0$$

(iii)

$$22$$

(iv)

$$l = \sqrt{x^2 + h^2}$$

B

(v)

$$2$$

S

E

(vi)

$$3$$

Solution of Q2

(i)

Equilateral

(ii)

ordinate

(iii)

$$1$$

(iv)

irrational

(v)

Quadratic Formula

(vi)

$$50$$



Solution of Q3

(i) Volume of a cuboid $\rightarrow b \times a \times c$ [bac]

(ii) Area of square $\rightarrow a^2$

(iii) $\sin^2 A + \cos^2 A \rightarrow 1$

(iv) $\tan(90^\circ - A) \rightarrow \cot A$

(v) $9 \sec^2 A - 9 \tan^2 A \rightarrow 9$

(vi) Distance between points (0, 4) & (3, 0) $\rightarrow 5$

Solution of Q4

(i) The common point of the tangent & the circle is called point of contact.

(ii) 0

(iii) Class mark = $\frac{\text{Upper limit} + \text{Lower limit}}{2}$

$$= \frac{20 + 40}{2}$$

$$= \frac{60}{2}$$

$$= 30 \text{ } \leftarrow \text{Ans}$$

प्रश्न 3

(iv) Discriminate = $b^2 - 4ac$

(v) $S_n = \frac{n}{2} [2a + (n-1)d]$

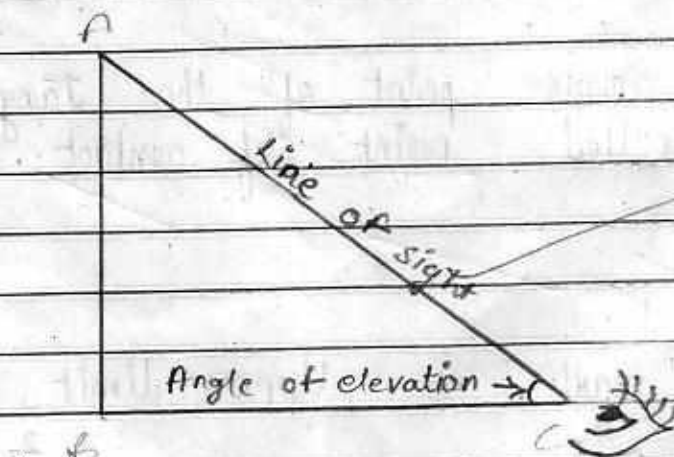
or

$S_n = \frac{n}{2} [a + a_n]$

(vi) Angle of elevation $\rightarrow$

B
S
E

An angle of elevation of an object viewed, is an angle formed by the line of sight with horizontal when the object is above the horizontal level, i.e., in the case when we raise our head to look at the object.





Solution of Q 5

(i) True

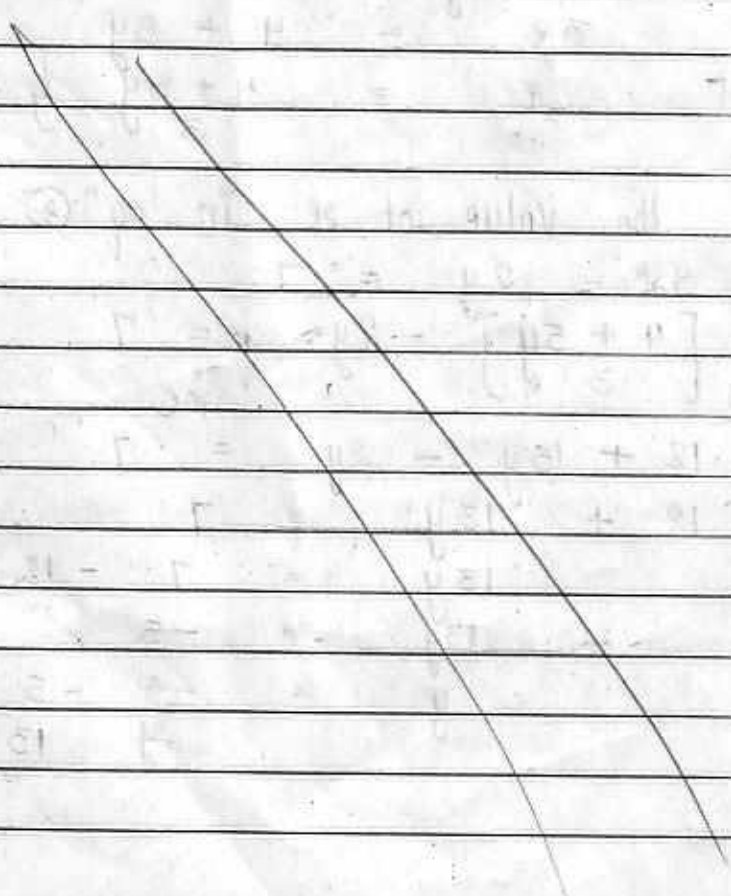
(ii) False

(iii) True

(iv) False

(v) True

(vi) False





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Solution of Q23(04)

$$3x - 5y - 4 = 0$$

$$9x = 2y + 7$$

$$3x - 5y = 4 \quad \text{--- (1)}$$

$$9x - 2y = 7 \quad \text{--- (2)}$$

Using Substitution Method :-From eqⁿ (1)

$$3x - 5y = 4$$

$$3x = 4 + 5y$$

$$x = \frac{4 + 5y}{3} \quad \text{--- (3)}$$

Put the value of x in eqⁿ (2)

$$9x - 2y = 7$$

$$9 \left[\frac{4 + 5y}{3} \right] - 2y = 7$$

$$12 + 15y - 2y = 7$$

$$12 + 13y = 7$$

$$13y = 7 - 12$$

$$13y = -5$$

$$y = \frac{-5}{13}$$

B
S
E



$$y = \frac{-5}{13}$$

Put the value of y in eqⁿ (3)

$$x = \frac{4 + 5y}{3}$$

$$x = \frac{4 + 5 \times \frac{-5}{13}}{3}$$

$$x = \frac{4 + \left(\frac{-25}{13}\right)}{3}$$

$$x = \frac{4 - \frac{25}{13}}{3}$$

$$x = \frac{52 - 25}{13} \div 3$$

$$x = \frac{27}{13} \div 3$$

$$x = \frac{27}{13} \times \frac{1}{3}$$

$$x = \frac{9}{13}$$

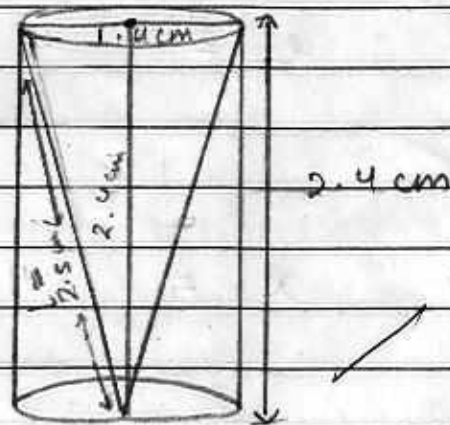


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Ans $\rightarrow$

x	$=$	$\frac{9}{13}$
y	$=$	$\frac{-5}{13}$

Solution of Q 22

B
S
E:- Given $\therefore$ height of cylinder = height of cone = (h) = 2.4 cmdiameter of cylinder = diameter of cone = (d) = 1.4 cm

$$r = \frac{d}{2}$$

$$r = \frac{1.4}{2}$$

$$r = 0.7 \text{ cm}$$



$$\begin{aligned}
 \text{slant height } [l] &= \sqrt{r^2 + h^2} \\
 &= \sqrt{(0.7)^2 + (2.4)^2} \\
 &= \sqrt{0.49 + 5.76} \\
 &= \sqrt{6.25} \\
 &= 2.5 \text{ cm}
 \end{aligned}$$

$$\begin{aligned}
 \text{Total surface area of remaining solid} \\
 &= \text{TSA of cylinder} - \text{base area of cone} + \text{CSA of cone} \\
 &= 2\pi r [h + r] - \pi r^2 + \pi r l \\
 &= 2\pi r h + 2\pi r^2 - \pi r^2 + \pi r l \\
 &= 2\pi r h + \pi r^2 + \pi r l \\
 &= \pi r [2h + r + l] \\
 &= \frac{22}{7} \times 0.7 [2 \times 2.4 + 0.7 + 2.5] \\
 &= 22 \times 0.1 [4.8 + 3.2] \\
 &= 2.2 [8.0] \\
 &= 2.2 \times 8 \\
 &= 17.6 \text{ cm}^2
 \end{aligned}$$

Ans:- The total surface area of remaining solid is 17.6 cm² [approx].



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Solution of Q21

Literacy rate (in%)	No. of cities ^(fi)	x_i	$f_i \times x_i$
45 - 55	3	50	150
55 - 65	10	60	600
65 - 75	11	70	770
75 - 85	8	80	640
85 - 95	3	90	270
Total	35		2430

B
S
E

$$\text{Mean} = \frac{\sum f_i \times x_i}{\sum f_i}$$

$$= \frac{2430}{35}$$

$$= \frac{486}{7}$$

$$= 69.4285 \text{ [approx]}$$

Ans :- 69.4285 [approx]

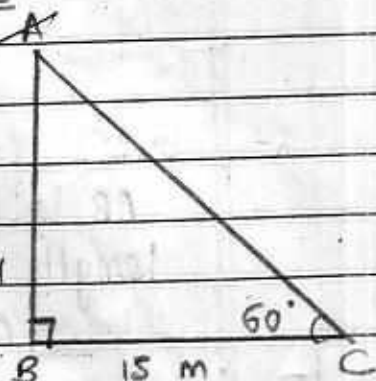


Solution of Q 20

Given :-

Tower is 15 m away from

A point on the ground is 15 m away from the foot of tower
 $BC = 15 \text{ m}$



Ans

Angle of elevation = 60°

To Find :-

height of the tower = $AB = ?$

Solution :-

Let the height of the tower $[AB]$ be h .

In ΔABC

$$\frac{AB}{BC} = \frac{P}{B} = \tan \theta$$

$$\frac{AB}{BC} = \tan 60^\circ$$

$$h = \sqrt{3}$$

$$h = 15\sqrt{3} \text{ m}$$

The height of the tower is $15\sqrt{3} \text{ m}$



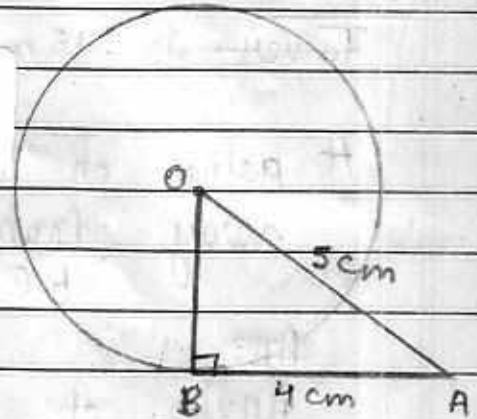
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Solution of Q1904:- Given :-

AB is a tangent.

Length of tangent = 4 cm.

OA = 5 cm

:- To find :-

Radius of circle [OB] = ?

B

S:-

E

Solution :-In ΔOBA

Using PGT,

$$H^2 = P^2 + B^2$$

$$(OA)^2 = (OB)^2 + (AB)^2$$

$$(5)^2 = OB^2 + (4)^2$$

$$25 = OB^2 + 16$$

$$25 - 16 = OB^2$$

$$9 = OB^2$$

$$OB^2 = 9$$

$$OB = \sqrt{9}$$

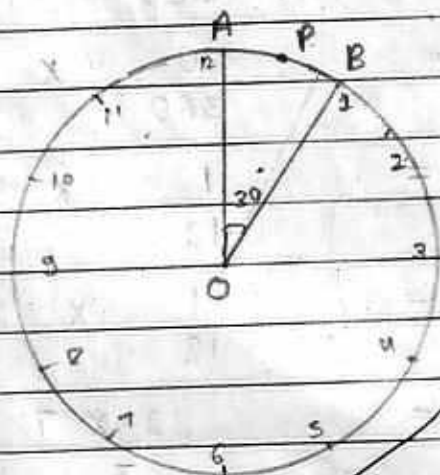
$$OB = 3 \text{ cm}$$

Ans:- Radius of circle = 3 cm



Solution of 18

अथ



Given :-

The length of the minute hand of a clock
i.e. radius of clock = 14 cm

Angle subtended by the minute hand in
5 minutes = 30°

To find :-

Area swept by the minute hand in 5 minutes
[APB] = ?

Solution :-

$$\text{Area of minor sector} = \frac{\theta}{360} \times \pi r^2$$



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Q- Area swept by the minute hand in 5 minutes

$$= \frac{\theta}{360} \times \pi r^2$$

$$= \frac{30}{360} \times \frac{22}{7} \times (14)^2$$

$$= \frac{1}{12} \times \frac{22}{7} \times 196$$

$$= \frac{1}{12} \times 22 \times 28$$

$$= \frac{22 \times 7}{3}$$

$$= \frac{154}{3} \text{ cm}^2$$

B
S
E

Ans. Area swept by the minute hand in 5 minutes is $\frac{154}{3} \text{ cm}^2$

Solution of Q17

Q- Given $\Rightarrow$

$$P(4, 6) \quad \& \quad Q(6, 8)$$

$$(x_1, y_1) \quad (x_2, y_2)$$

Q- To find $\Rightarrow$

Distance between point $P(4, 6)$ & $Q(6, 8)$



Solution $\Rightarrow$

$$\begin{aligned}
 PQ &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\
 &= \sqrt{(6 - 4)^2 + (8 - 6)^2} \\
 &= \sqrt{(2)^2 + (2)^2} \\
 &= \sqrt{4 + 4} \\
 &= \sqrt{8} \\
 &= 2\sqrt{2} \text{ unit}
 \end{aligned}$$

$2\sqrt{2}$ unit

Solution of Q16

'04'

Given $\Rightarrow$

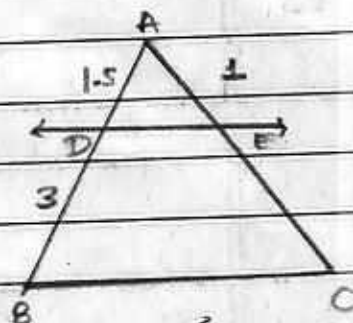
In ΔABC

$DE \parallel BC$

$AE = 1 \text{ cm}$

$AD = 1.5 \text{ cm}$

$DB = 3 \text{ cm}$



To find $\Rightarrow$

$EC = ?$

Solutions $\Rightarrow$

In ΔABC , $DE \parallel BC$

Then, According to Basic Proportionality Theorem,
If a line is drawn parallel to the one side



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of a triangle to intersect the other two sides in a distinct point, then the other two sides are divided in the same ratio.

$$\frac{AD}{DB} = \frac{AE}{EC}$$

$$\frac{1.5}{3} = \frac{1}{EC}$$

$$0.5 = \frac{1}{EC}$$

$$0.5 \times EC = 1$$

$$EC = \frac{1}{0.5}$$

$$EC = \frac{1 \times 10}{0.5}$$

$$EC = \frac{10}{5}$$

$$EC = 2 \text{ cm}$$

Ans:-

$$EC = 2 \text{ cm}$$

B
S
E

Solution of Q15

Given :-

A.P. 2, 7, 12, ...

To find :-

10th term or $a_{10} = ?$

Solution :-

A.P. 2, 7, 12, ...

$$a = 2$$

$$d = a_2 - a_1 = 7 - 2 = 5$$

$$a_3 - a_2 = 12 - 7 = 5$$

$$\therefore d = 5$$

$$a_{10} = a + (n-1)d$$

$$= a + (10-1)d$$

$$= 2 + 9 \times 5$$

$$= 2 + 45$$

$$= 47$$

$$\boxed{a_{10} = 47}$$



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Solution of Q14Q14:- Given :-

$$2x^2 - 4x + 3 = 0$$

:- To find :-Discriminant $[D] = ?$ B
S
ESolution :-

①

$$a = 2$$

$$b = -4$$

$$c = 3$$

$$D = b^2 - 4ac$$

$$D = (-4)^2 - 4 \times 2 \times 3$$

$$D = 16 - 24$$

$$D = -8$$

Odddy

$$D < 0$$

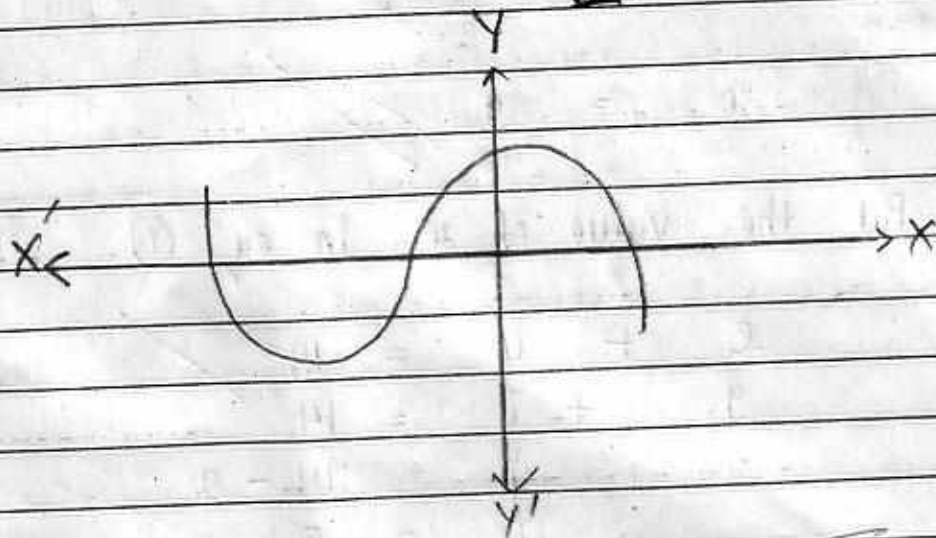
$$-8 < 0$$

There is no real roots.

Ans :-

$$D = -8$$

Solution of Q13



line touches the x -axis at 3 points.

So, the number of zeroes is 3

of zeroes = 3

Solution of Q12

or

$$\begin{aligned} x + y &= 14 & \text{--- (1)} \\ x - y &= 4 & \text{--- (2)} \end{aligned}$$

Using Elimination Method $\therefore$

$$\begin{array}{rcl} x + y & = & 14 \\ x - y & = & 4 \\ \hline 2x & = & 18 \end{array}$$



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$$2x = 18$$

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

$$x = 9$$

Put the value of x in eqⁿ ①

$$x + y = 14$$

$$9 + y = 14$$

$$y = 14 - 9$$

$$y = 5$$

B
S
E

Ans

x	$= 9$
y	$= 5$

Solution of Q 11

Q4

:- Given :->

$$\text{sum of zeroes } (\alpha + \beta) = -1$$

$$\text{product of zeroes } (\alpha \times \beta) = \sqrt{5}$$

:- To find :->

Quadratic polynomial



Solution :-

Quadratic polynomial =

$$x^2 - (\alpha + \beta)x + (\alpha \times \beta)$$

$$x^2 - (-1)x + \sqrt{5}$$

$$x^2 + x + \sqrt{5}$$

$$x^2 + x + \sqrt{5}$$

Solution of Q10

'or'

To find :- HCF of 17, 23 & 29

Solution :-

Using Prime Factorisation Method :-

$$\begin{array}{c|c} 17 & 17 \\ \hline & 1 \end{array}$$

$$\begin{array}{c|c} 23 & 23 \\ \hline & 1 \end{array}$$

$$\begin{array}{c|c} 29 & 29 \\ \hline & 1 \end{array}$$

$$= 17 \times 1$$

$$= 23 \times 1$$

$$= 29 \times 1$$

$$= 1$$

HCF of 17, 23 & 29 is 1

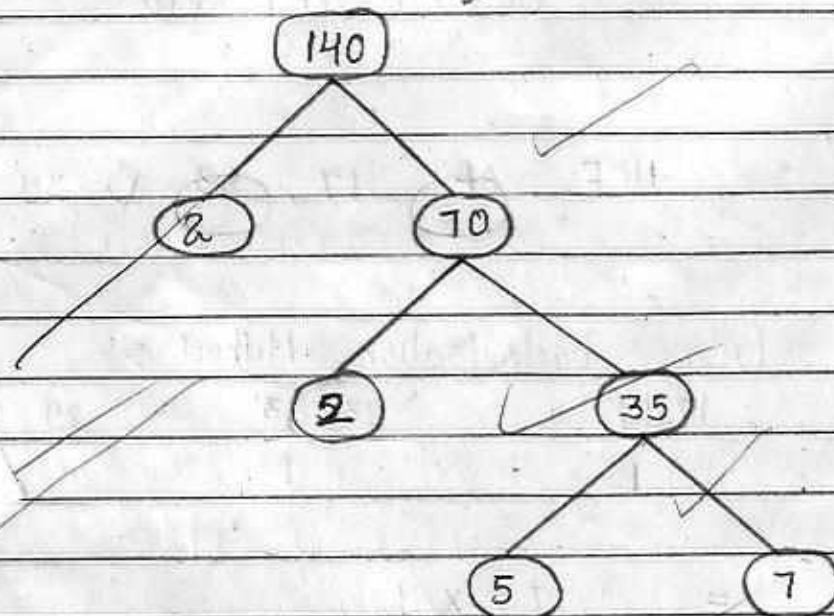
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Solution of Q9

:- 140

2	140
2	70
5	35
7	7
	1

B
S
E



www.oddyinc

Ans :- $140 = 2 \times 2 \times 5 \times 7$
 $140 = 2^2 \times 5 \times 7$



Solution of Q 8

When a die is thrown once
then the total no. of outcomes = 6

No. of prime no. = 4

Probability of getting a prime number
= $\frac{\text{No. of favourable outcome}}{\text{Total no. of outcomes}}$

Probability of getting a prime no. =

Solution of Q 7

'or'

No. of red balls = 3

No. of black balls = 5

Total number of balls = 8

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$$P(E) = \frac{\text{No. of favourable outcome}}{\text{Total no. of outcome}}$$

$$\text{Probability of getting a red ball} = \frac{\text{No. of red ball}}{\text{Total no. of balls}}$$

Ans: **B
S
E**

$$\frac{3}{8}$$

Solution of Q6
'or'

$$\Rightarrow \frac{\sin 18^\circ}{\cos 72^\circ}$$

Q- We know that $\sin A = \cos (90^\circ - A)$

Q- So, we can write $\sin 18^\circ = \cos (90^\circ - 18^\circ)$

$$\begin{aligned} \frac{\sin 18^\circ}{\cos 72^\circ} &= \frac{\cos (90^\circ - 18^\circ)}{\cos 72^\circ} \\ &= \frac{\cos 72^\circ}{\cos 72^\circ} \\ &= 1 \end{aligned}$$



Ans :-

1

1