

केवल मूल्यांकनकर्ता के उपयोग हेतु!

माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

32 पृष्ठीय



32 PAGES ANSWER BOOK

विषय: Subject:

Mathematics

विषय कोड: Subject Code:

100

परीक्षा का तिथि/Date of Exam:

11/03/23

उपकरण का माध्यम
Medium of answering the paper:

English

प्रश्न पत्र का सेट
Set of the question paper: D

गोले भरने का उदाहरण
सही तरीका

● ○ ○ ○

गलत तरीका

○ ● ○ ● ○

नोट -

इस सेट को 30 एवं 45 मिनट के भीतर ही खोलना है।

केवल परीक्षक द्वारा भरा जावे।
प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टि करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक
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Previous Pathshala

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

परीक्षक एवं उपमुख्य परीक्षक

कुल प्राप्तांक शब्दों में : कुल प्राप्तांक अंकों में

माध्यमिक शिक्षा मण्डल, मध्य प्रदेश

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प्रश्न क्र.

Solution of Q1

(i)

$a_1 \neq b_1$
 $a_2 \quad b_2$

(ii)

$ax^2 + bx + c = 0$

(iii)

22

(iv)

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

B
S
E

2

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 \leftarrow Ans



प्रश्न 3

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

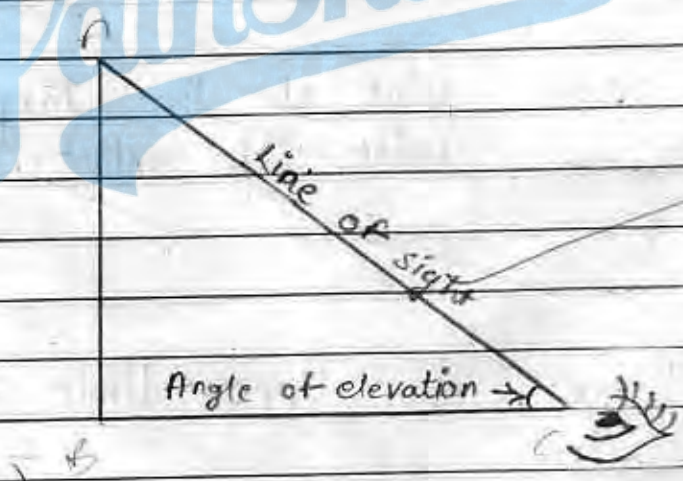
(v) $S_n = \frac{n}{2} [2a + (n-1)d]$

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

(vi) Angle of elevation :->

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

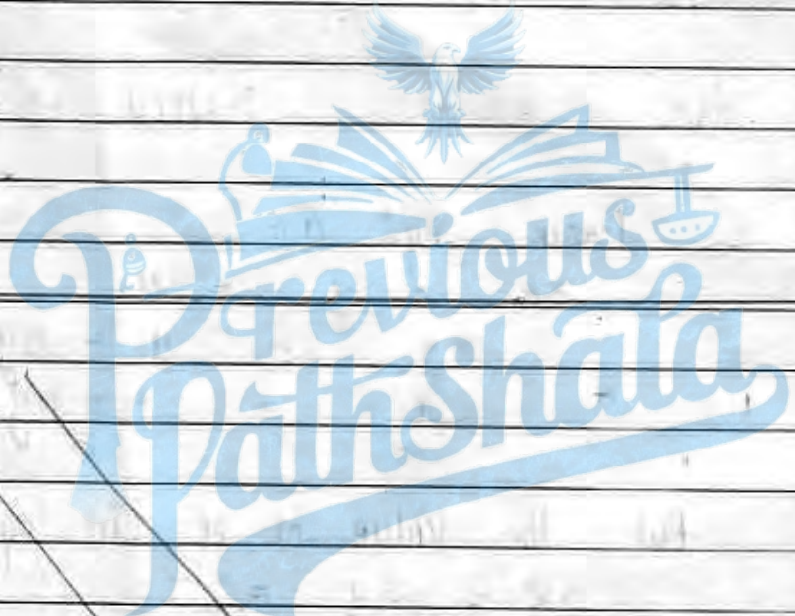
(ii) False

(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)

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

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

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

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

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

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

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

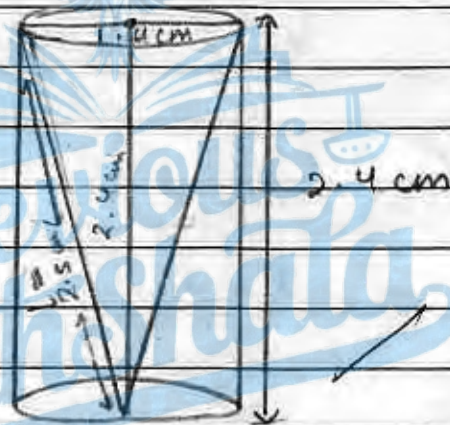
$$x = \frac{\cancel{27}}{\cancel{13}} \times \frac{1}{3} = \frac{9}{13}$$

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Ans \rightarrow

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

Solution of Q 22

:- Given \rightarrow

height of cylinder = height of cone = (h) = 2.4 cm

diameter of cylinder = diameter of cone = (d) = 1.4 cm

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

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

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



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

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

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 (f_i)	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

$$\begin{aligned} \text{Mean} &= \frac{\sum f_i \times x_i}{\sum f_i} \\ &= \frac{2430}{35} \\ &= \frac{486}{7} \\ &= 69.4285 \text{ [approx]} \end{aligned}$$

Ans :- 69.4285 [approx]

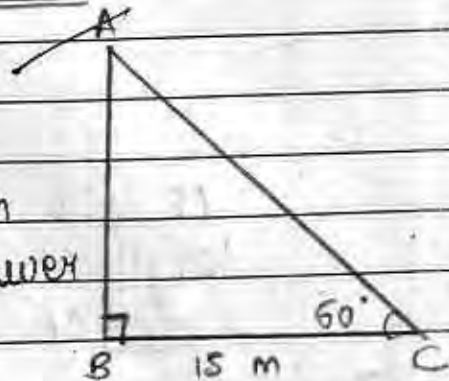


Solution of Q 20

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 $15\sqrt{3} \text{ m}$.

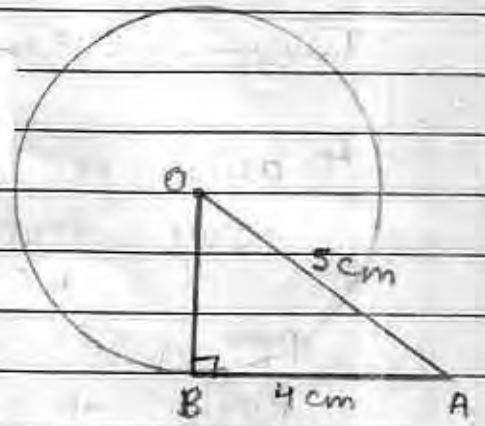


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Solution of Q19
04

:- 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

(04)



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 :->

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

$$= \frac{30}{360} \times \pi r^2$$

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

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

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

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

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

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

$P(4, 6)$ & $Q(6, 8)$
 (x_1, y_1) & (x_2, y_2)

Q- To find \Rightarrow

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



Solution :->

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

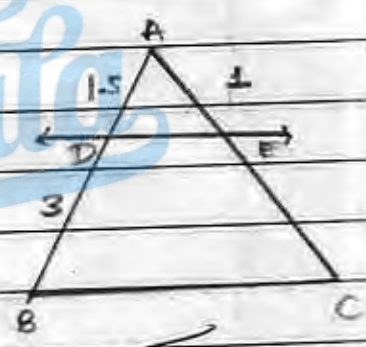
2√2 unit

Solution of Q16

'04'

Given :->

- In ΔABC
- $DE \parallel BC$
- $AE = 1 \text{ cm}$
- $AD = 1.5 \text{ cm}$
- $DB = 3 \text{ cm}$



To find :->

$EC = ?$

Solutions :->

In ΔABC , $DE \parallel BC$

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



Solution of Q15

Given :-

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

To find :-

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

Solution :-

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

$$a = 2$$

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

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

$$\therefore d = 5$$

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

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

$$= 2 + 9 \times 5$$

$$= 2 + 45$$

$$= 47$$

$$a_{10} = 47$$



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Solution of Q14

04

:- Given :-

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

:- To find :-

$$\text{Discriminant } [D] = ?$$

B:- Solution :-S
E

$$a = 2$$

$$b = -4$$

$$c = 3$$

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

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

$$D = 16 - 24$$

$$D = -8$$

Oddy

$$D < 0$$

$$-8 < 0$$

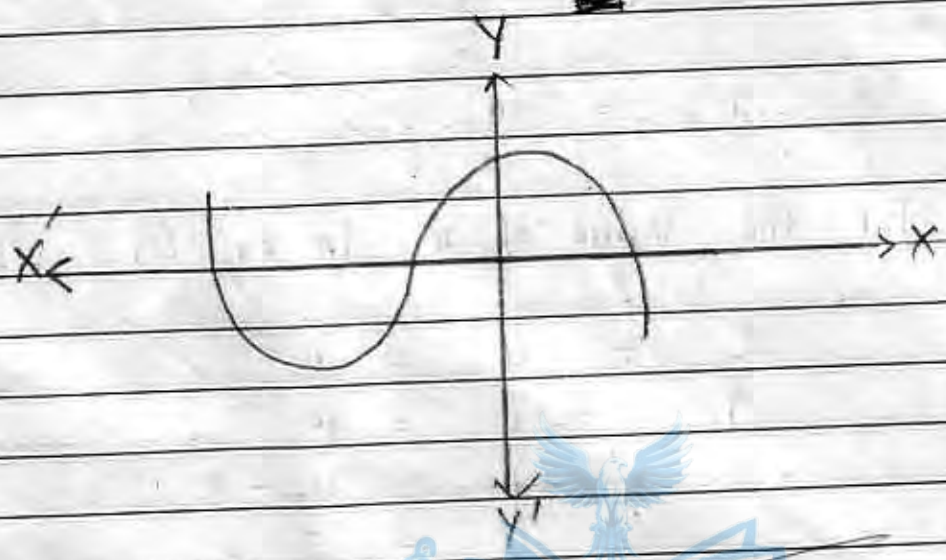
There is no real roots.

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

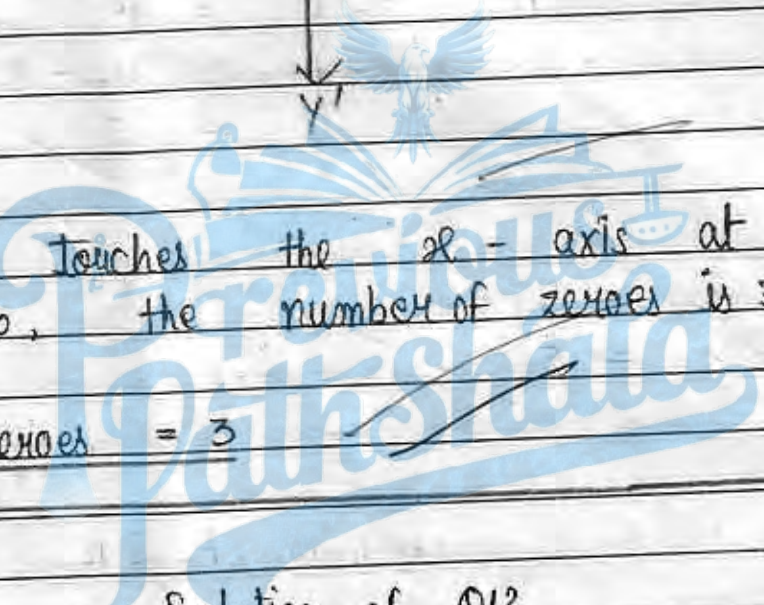
or

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

Using Elimination Method \therefore

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

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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 :->

17	17	23	23	29	29
	1		1		1

= 17 x 1

= 23 x 1

= 29 x 1

= 1

HCF of 17, 23 & 29 is 1

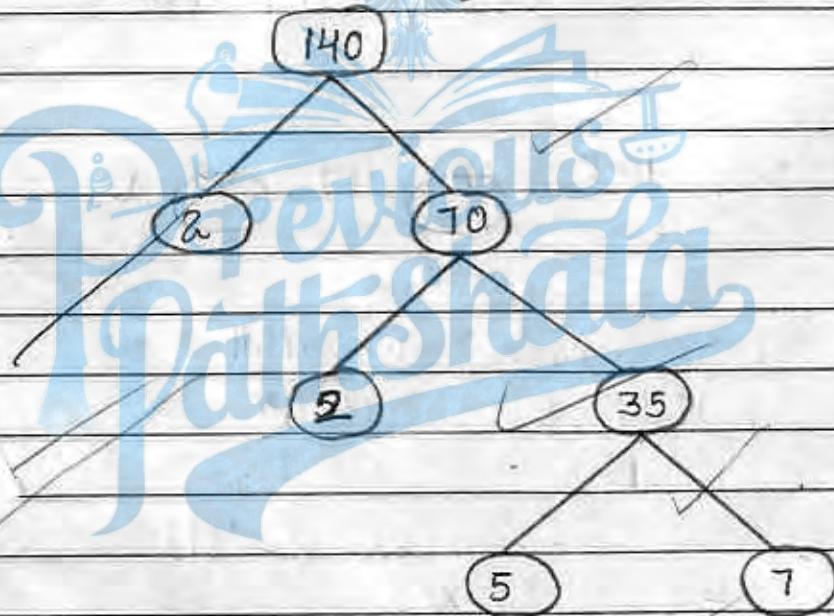
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Solution of Q9

Ans :- 140

2	140
2	70
5	35
7	7
	1

B
S
E



www.oddity.in

~~140 = 2 x 2 x 5 x 7~~

Ans :- 140 = 2² x 5 x 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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$$P(E) = \frac{\text{No. of favourable outcome}}{\text{Total no. of outcome}}$$

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

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

Ans: B
S
E

3
8

Solution of Q6

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

∴ We know that $\sin A = \cos(90^\circ - A)$
 ∴ So, we can write $\sin 18^\circ = \cos(90^\circ - 18^\circ)$

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

