YAKEEN NEET 2.0

2026

Basic Maths and Calculus (Mathematical Tools)

PHYSICS | **Lecture - 01**

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Question - 01

If $\tan\theta = \frac{4}{3}$. Find the value of $\sin\theta$

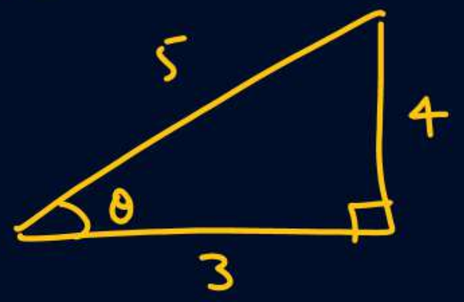
(1) $\frac{3}{5}$

(2) $\frac{4}{3}$

(3) $\frac{4}{5}$

(4) $\frac{5}{4}$

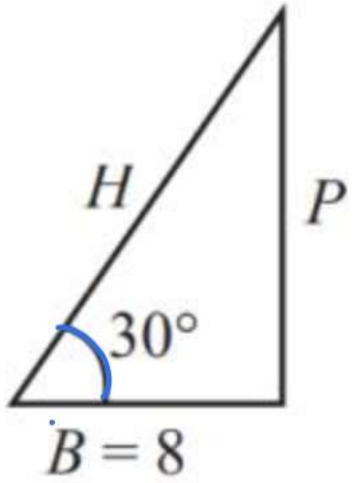
$\theta = 53^\circ$



Ans : (3)

Question - 02

Find the value of P



(1) $\frac{\sqrt{3}}{8}$

(2) 8

(3) $\frac{8}{\sqrt{3}}$

(4) 0

$\tan 30 = \frac{P}{8}$

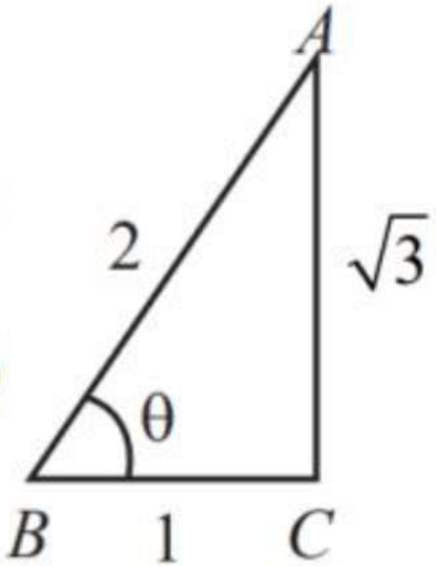
$\frac{1}{\sqrt{3}} = \frac{P}{8}$

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

Ans : (3)

Question - 03

Find the angle $\angle ABC$



$\tan\theta = \frac{\sqrt{3}}{1}$

$\theta = 60^\circ$

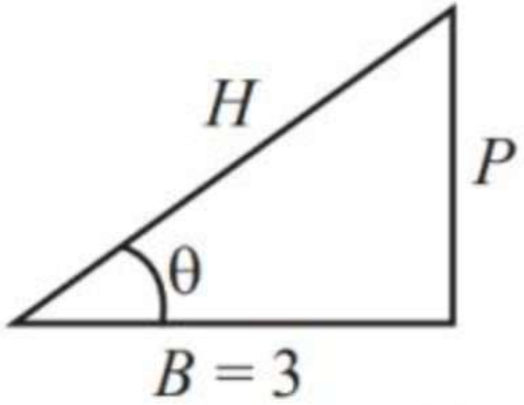
(1) 0° (2) 60°

(3) 30° (4) 45°

Ans : (2)

Question - 04

If θ is very small then find H.



(1) 3

(2) $\frac{3}{5}$

(3) $\frac{4}{5}$

(4) 5

$\sin\theta \simeq \tan\theta$

$\frac{P}{H} \simeq \frac{P}{3}$

Ans : (1)

Question - 05

If $y = \frac{\tan\theta}{\theta}$, then find the value of y at $\theta = 10°$.

(1) $10°$ (2) 0

(3) 1 (4) $\sqrt{3}$

$y \cong \frac{\theta}{\theta} = 1$

Ans : (3)

Question - 06

Find the value of $\sin 105^\circ$

(1) $\frac{\sqrt{3}}{2}$

(2) $\frac{\sqrt{3}}{2\sqrt{2}}$

(3) $\frac{2\sqrt{2}}{\sqrt{3}+1}$

(4) $\frac{\sqrt{3}+1}{2\sqrt{2}}$

$= \sin(60+45) = \sin 60 \cos 45 + \cos 60 \sin 45$

$= \frac{\sqrt{3}}{2}\frac{1}{\sqrt{2}} + \frac{1}{2} \times \frac{1}{\sqrt{2}} = \frac{\sqrt{3}+1}{2\sqrt{2}}$

Ans : (4)

Question - 07

Find the value of $\cos 75° = \cos(45+30) = \cos 45 \cos 30 - \sin 45 \sin 30$

$= \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}} \times \frac{1}{2} = \frac{\sqrt{3}-1}{2\sqrt{2}}$

(1) $\frac{\sqrt{3}-1}{2\sqrt{2}}$ ✓

(2) $\frac{2\sqrt{2}}{\sqrt{3}-1}$

(3) $\frac{\sqrt{3}}{\sqrt{2}}$

(4) $\sqrt{2}$

Ans : (1)

Question - 08

Find the value of $\sin 75° + \sin 15°$

(1) $0°$

(2) $\frac{2}{\sqrt{3}}$

(3) $\sqrt{3}$

(4) $\sqrt{\frac{3}{2}}$

$= \sin(45+30) + \sin(45-30)$

$= \sin 45 \cos 30 + \cos 45 \sin 30 + \sin 45 \cos 30 - \cos 45 \sin 30$

$= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \frac{\sqrt{3}}{2} = 2 \frac{1}{\sqrt{2}} \frac{\sqrt{3}}{2} = \sqrt{\frac{3}{2}}$

$x + x = 2x$

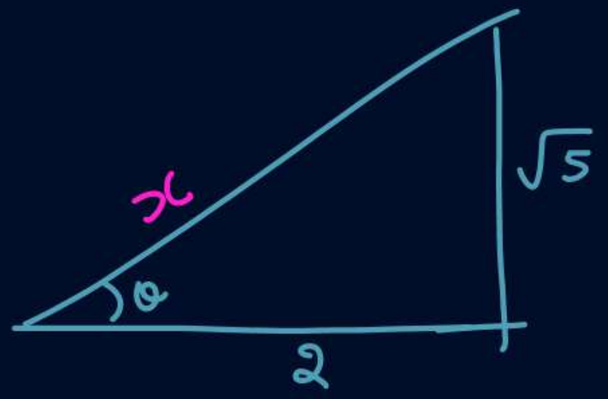
Ans : (4)

Question - 09

If $\tan\theta = \frac{\sqrt{5}}{2}$ then; value of $\cos\theta$ is

(1) $\frac{2}{3}$ (2) $\frac{3}{2}$

(3) $\frac{\sqrt{5}}{3}$ (4) 5



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

$5 + 4 = x^2$

$x = 3$

$\cos\theta = \frac{2}{x} = \frac{2}{3}$

Ans : (1)

Question - 10

Which of the following is correct for $\sin(2\theta)$ $= 2\sin\theta\cos\theta$

(1) $2 \sin\theta \cdot \cos\theta$

(2) $\sin^2\theta$

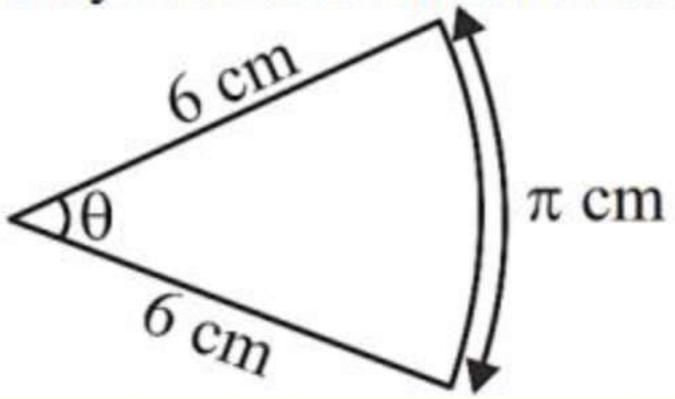
(3) $\sin^2\theta - \cos^2\theta$

(4) $2 \sin\theta$

Ans : (1)

Question - 11

A circular arc of length π cm. Find angle subtended by it at the centre in radian and degree.



$$\theta = \frac{\text{arc}}{\text{Radius}} = \frac{\pi}{6} \text{ rad} \equiv 30^\circ$$

Ans : (30°)

Question - 12

Convert 135° into radians.

$$135 \times \frac{\pi}{180} = \frac{3\pi}{4}$$

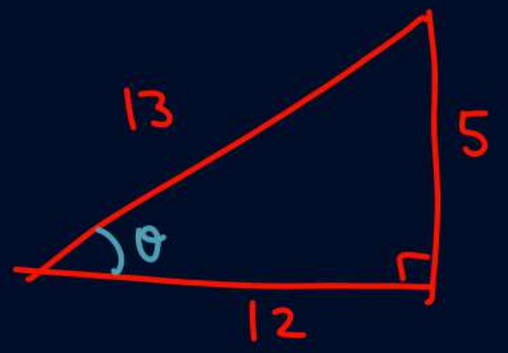
Ans : $\frac{3\pi}{4}$ radians

Question - 13

The two shorter sides of right angled triangle are 5 cm and 12 cm. Let θ denote the angle opposite to the 5 cm side. Find sinθ, cosθ and tanθ.

$5^2 + (12)^2 = 25 + 144$

$= 169 \equiv 13^2$



$\sin\theta = \frac{5}{13}$

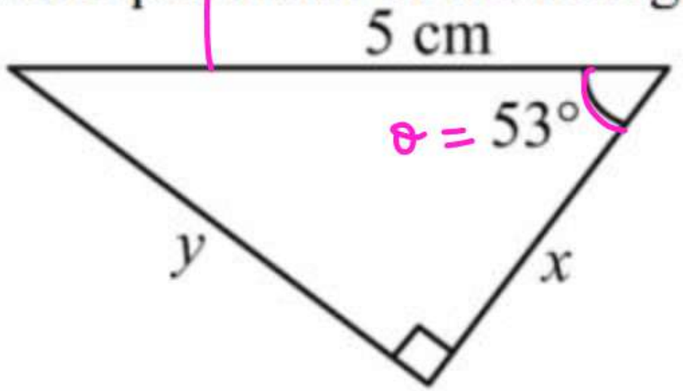
$\cos\theta = \frac{12}{13}$

$\tan\theta = \frac{5}{12}$

Ans : $\sin\theta = \frac{5}{13}, \cos\theta = \frac{12}{13}, \tan\theta = \frac{5}{12}$

Question - 14

Find x, y and perimeter of the triangle shown



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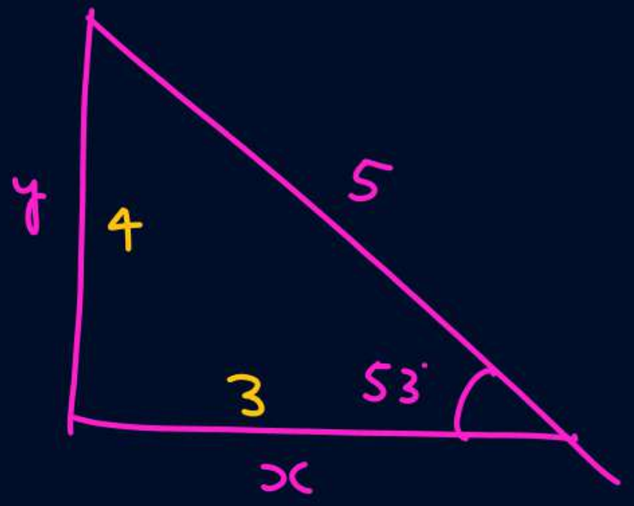
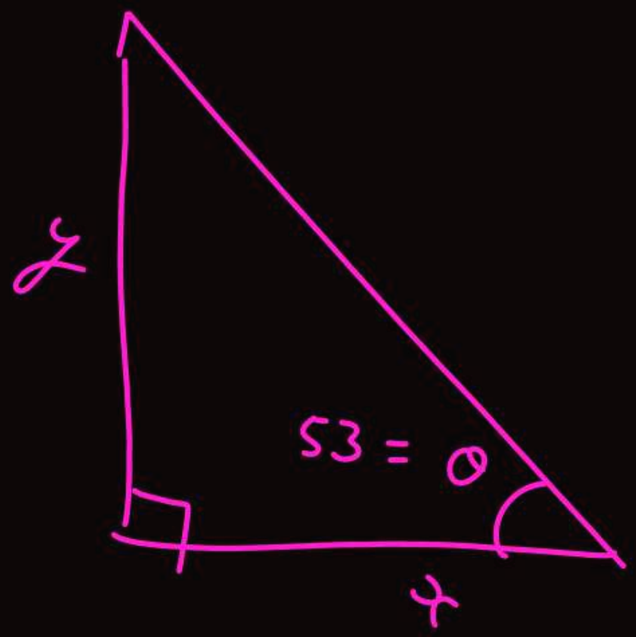


$$\cos 53^\circ = \frac{x}{5}$$

Ans : x = 3cm, y = 4cm, Perimeter of the triangle = 12 cm


y
53 = θ
x

Question - 15

Find the value of:

(i) $\sin 30° + \cos 60°$

(ii) $\sin 0° - \cos 0°$

(iii) $\tan 45° - \tan 37°$

$= \frac{1}{2} + \frac{1}{2} = 1$

$= 0 - 1 = -1$

$1 - \frac{3}{4} = \frac{1}{4}$

Ans : (i) 1, (ii) –1, (iii) 1/4

Question - 16

Change degree into radian:
(1) 160°, (2) 135°, (3) 75°, (4) 65°

$\frac{160\pi}{180}$ $\frac{135\pi}{180}$ $\frac{75\pi}{180}$ $\frac{65\pi}{180}$

$\frac{8\pi}{9}$, $\frac{27\pi}{36} = \frac{3}{4}\pi$

$\frac{25\pi}{60} = \frac{5\pi}{12}$

Ans : (1) $\frac{8\pi}{9}$, (2) $\frac{3\pi}{4}$, (3) $\frac{5\pi}{12}$, (4) $\frac{13\pi}{36}$

Question - 17

Change radian into degree:

(1) $\frac{\pi}{4}$, (2) $\frac{7\pi}{2}$, (3) $\frac{3\pi}{5}$, (4) $\frac{2\pi}{3}$, (5) $\frac{3\pi}{4}$

$\pi = 180$

$\frac{7\pi}{2} = \frac{7 \times 180}{2}$

Ans : (1) 45°, (2) 630°, (3) 108°, (4) 120°, (5) 135°

Question - 17

Change radian into degree:

(1) $\frac{\pi}{4}$, (2) $\frac{7\pi}{2}$, (3) $\frac{3\pi}{5}$, (4) $\frac{2\pi}{3}$, (5) $\frac{3\pi}{4}$

$\frac{3\times180}{5} = 3\times36$

$= 108^\circ$

$\pi = 180^\circ$

$\frac{7\pi}{2} = \frac{7\times180}{2} = 7\times90 = 630^\circ$

Ans : (1) 45°, (2) 630°, (3) 108°, (4) 120°, (5) 135°

Question - 18

Evaluate:

(1) $\cos 15° = \cos(45-30) = \frac{1}{\sqrt{2}}\frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \times \frac{1}{2}$

(2) $\cos 53° = 3/5$

(3) $\tan 37° = 3/4$

(4) $\sin 53° - \cos 37°$

$\frac{4}{5} - \frac{4}{5} = 0$

Ans : (1) $\frac{\sqrt{3}+1}{2\sqrt{2}}$, (2) 3/5, (3) 3/4, (4) 0

Question - 19

cos 2A is equal to:

(1) $1 - 2\sin^2 A$ (2) $2\cos^2 A - 1$

(3) $\cos^2 A - \sin^2 A$ (4) All

Ans : (4)

Question - 20

$\sin^2 4\theta + \cos^2 4\theta$ is equal to:

(1) 4 (2) 2

(3) −1 (4) 1

$\sin^2 4\theta + \cos^2 4\theta = ?$

$\sin^2\theta + \cos^2\theta = 1$

$\sin^2(\text{कुछ}) + \cos^2(\text{कुछ}) = 1$

$\sin^2\left(\log_e e^{a^{x^2+4x+3}}\right) + \cos^2\left(\log_e e^{a^{x^2+4x+3}}\right) = 1$

Ans : (4)

Question - 21

cos (A + B) is equal to:

(1) cos A cos B + sin A cos B

(2) cos A sin B – sin A sin B

(3) cos A cos B + sin A sin B

(4) cos A cos B – sin A sin B

Ans : (4)

Question - 22

$1 + \tan^2 \theta$ is equal to:

(1) $\sec \theta$ (2) $\sec 2\theta$

(3) $\sec^2 \theta$ (4) $2 \sec \theta$

Ans : (3)

Question - 23

Match List-I with List-II.

List-I		List-II	
(A)	$\sin 30°$ (iii)	(I)	$\sqrt{3}$
(B)	$\tan 30°$ (i) $\frac{1}{\sqrt{3}}$	(II)	$\frac{\sqrt{3}}{2}$
(C)	$\cos 30°$ (ii) $\frac{\sqrt{3}}{2}$	(III)	$\frac{1}{2}$
(D)	$\cot 30°$ (i) $\sqrt{3}$	(IV)	$\frac{1}{\sqrt{3}}$

Choose the correct answer from the options given below:

(1) A-I, B-III, C-IV, D-II

(2) A-IV, B-II, C-III, D-I

(3) A-II, B-I, C-IV, D-III

(4) A-III, B-IV, C-II, D-I

$\cot 30° = \frac{\cos\theta}{\sin\theta} = \frac{\cos 30}{\sin 30} = \frac{\sqrt{3}/2}{1/2} = \sqrt{3}$

$\cot 30° = \frac{1}{\tan 30°} = \frac{1}{\left(\frac{1}{\sqrt{3}}\right)} = \sqrt{3}$

Ans : (4)

Question - 24

$(\cos 30)^2$

Evaluate

$4 \tan^2 45^\circ + 4 \cos^2 30^\circ - 8 \sin^2 60^\circ$

(1) 1 (2) 0

(3) 2 (4) 4

$\tan^2 45^\circ = (\tan 45)^2$

$4 (1)^2 + 4 \left(\frac{\sqrt{3}}{2}\right)^2 - 8 \left(\frac{\sqrt{3}}{2}\right)^2$

$\sin^2\theta = (\sin\theta)^2$

$\sin^3\theta = (\sin\theta)^3$

$4 + 4 \times \frac{3}{4} - 8 \times \frac{3}{4}$

$= 4 + 3 - 6 = 1$

Ans : (1)

Question - 25

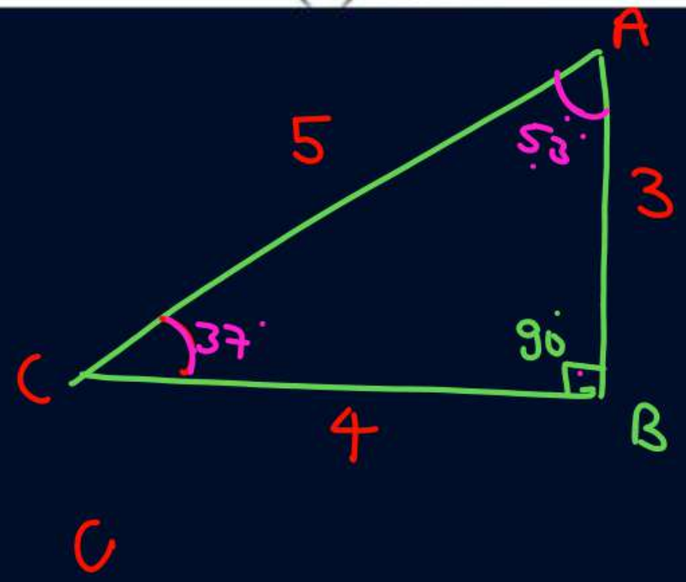
$\sin 37^\circ = \frac{3}{5}$

In ΔABC, right angled at B and $\sin C = \frac{3}{5}$, then ratio of sin A and cos A is:

$C = 37^\circ$

(1) 4 : 3 (2) 3 : 4

(3) 1 : 7 (4) 7 : 4



$\frac{\sin A}{\cos A} = \tan A = \tan 53^\circ = \frac{4}{3}$

C

Ans : (1)

Question - 26

Value of $\sin(37°)\cos(53°)$ is:

(1) 9/25 (2) 12/25

(3) 16/25 (4) 3/5

1

$\frac{3}{5} \times \frac{3}{5}$

Ans : (1)

Question - 27

If $\sin\theta = \cos\theta$, then the value of θ will be:

(1) $0°$ (2) $45°$

(3) $30°$ (4) $90°$

Ans : (2)

Question - 28

Value of $\sin(37°)\cos(53°)$ is:

(1) $\frac{9}{25}$ $\frac{3}{5} \times \frac{3}{5}$

(2) $\frac{12}{25}$

(3) $\frac{16}{25}$

(4) $\frac{3}{5}$

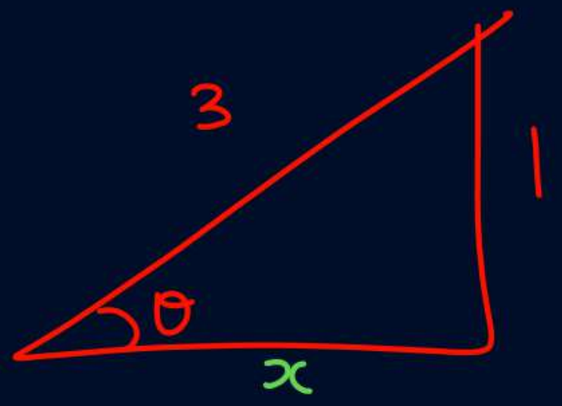
Ans : (1)

Question - 29

If $\sin\theta = \frac{1}{3}$, then $\cos\theta$ will be:

(1) $\frac{8}{9}$ (2) $\frac{4}{3}$

(3) $\frac{2\sqrt{2}}{3}$ (4) $\frac{3}{4}$



$1^2 + x^2 = 3^2$

$1 + x^2 = 9$

$x^2 = 8$

$x = 2\sqrt{2}$

$\cos\theta = \frac{x}{3} = \frac{2\sqrt{2}}{3}$

$\cos\theta = \sqrt{1 - \sin^2\theta}$

$= \sqrt{1 - \frac{1}{9}}$

$= \sqrt{\frac{8}{9}} = \frac{2\sqrt{2}}{3}$

$\sqrt{8} \equiv \sqrt{2 \times 2 \times 2}$

$= 2\sqrt{2}$

Ans : (3)

Question - 30

Find the approximate value of $\tan 2^\circ$ $= 2\,\frac{\pi}{180}$

(1) $\frac{\pi}{90}$ (2) $\frac{\pi}{180}$

(3) $\frac{\pi}{60}$ (4) $\frac{\pi}{30}$

Ans : (1)

Question - 31

Find value of $\sin(2^\circ + 3^\circ)$

$\sin 5^\circ \simeq 5\frac{\pi}{180} = \frac{\pi}{36}$

$\sin(A+B)$

$= \sin A \cos B + \cos A \sin B$

Ans : $(\pi/36)$

$$\theta = 2 \cdot \frac{\pi}{180} = \frac{\pi}{90} \qquad \sin^2\theta = (\sin\theta)^2$$

$$H = \frac{u^2 \sin^2\theta}{2g} \qquad R = \frac{u^2 \sin 2\theta}{g} \approx \frac{u^2 (2\theta)}{10}$$

$$= \frac{(90)^2 \times \theta^2}{2 \times 10}$$

$$= \frac{\cancel{90} \times \cancel{90} \times \frac{\pi}{\cancel{90}} \times \frac{\pi}{\cancel{90}}}{20 \times \cancel{90} \times \cancel{90}} = \frac{10}{20}$$

$$= \frac{1}{2}$$

$$\approx \frac{\cancel{90} \times \cancel{90} \times 2 \times \frac{\pi}{\cancel{90}}}{\cancel{10}}$$

$$= 18\pi$$

Question - 32

Find value of $\sin 2° + \sin 3°$

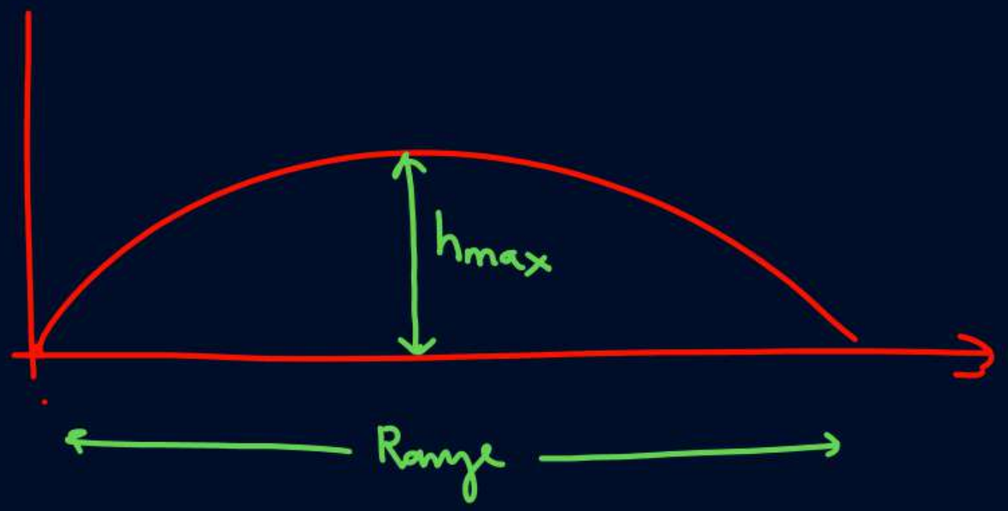
$$\frac{2\pi}{180} + \frac{3\pi}{180} = \frac{5\pi}{180} = \frac{\pi}{36}$$

Ans : $(\pi/36)$

Question - 33

Suppose
a particle is projected with velocity v = 90 m/s. at angle of θ with horizontal, than max height attain by particle H_{max} and range R of the particle is given by relation $H = \frac{u^2 \sin^2\theta}{2g}$, $R = \frac{u^2 \sin 2\theta}{g}$

Find the approximation value of H and R in a hypothetic condition if θ = 2°.
(take $\pi^2 = 10$, $g = 10\ m/s^2$)



Ans : H = 1/2, R = 18π

THANK YOU