

UNITS OF MEASUREMENTS OF ANGLES

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Class: VIII, Mathematics.
IIT FOUNDATION+

TEACHING TASK

01. $40^\circ 20' = 40^\circ + 20'$

$$40^\circ = 40 \times \frac{\pi}{180} = \frac{2\pi}{9}$$

$$20' = \left(20 \times \frac{1}{60}\right)^\circ = \frac{1}{3}^\circ = \frac{1}{3} \times \frac{\pi}{180} = \frac{\pi}{540}$$

$$\therefore 40^\circ 20' = \frac{2\pi}{9} + \frac{\pi}{540}$$

$$= \frac{121\pi}{540}$$

Ans: A

02 one minute $\rightarrow$ 360 revolutions

60 sec $\rightarrow$ 360 rev.

1 sec $\rightarrow$ 6 rev.

1 rev $\rightarrow$ 360° or 2π

6 rev $\rightarrow$ $6 \times 2\pi = 12\pi$ Ans: A

03 $45^\circ 20' 10'' = 45^\circ + 20' + 10''$

$$= 45^\circ + \left(\frac{20}{60}\right)^\circ + \left(\frac{10}{3600}\right)^\circ$$

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03

$$45^{\circ} 20' 10'' = 45^{\circ} + 20' + 10''$$

$$= 45^{\circ} + \left(\frac{20}{60}\right)^{\circ} + \left(\frac{10}{3600}\right)^{\circ}$$

$$= \left(\frac{16321}{360}\right)^{\circ}$$

$$= \left(\frac{16321}{360}\right)^{\circ} = \frac{16321}{360} \times \frac{10}{9} \text{ grades}$$

$$= 45.336111\pi$$

We know $1 \text{ degree} = \frac{100}{90} \text{ grades}$

$$= \frac{10}{9} \text{ grades}$$

$$45.336111 \times \frac{10}{9} \approx 50.373450$$

$$= 50^{\circ} 37' 34''$$

Ans: B

$$04. \left(\frac{16321}{360}\right)^{\circ} = \frac{16321}{360} \times \frac{\pi}{180}$$

$$= \frac{16321}{64800} \pi$$

$$= 0.251824 \times \pi$$

$$= 0.791057$$

$$= 0.79 \text{ radians}$$

05 ~~$1.2 \text{ radians} = \frac{12}{10} \times \frac{\pi}{180}$~~

05 $1.2^\circ = 1.2 \times 1^\circ$
 $= 1.2 \times \frac{180}{\pi}$
 $= 68.754^\circ$

Ans: A

06 $72^\circ = 72 \times 1^\circ$
 $= 72 \times \frac{\pi}{180} = \frac{2\pi}{5}$

Ans: B

07 $\frac{\pi}{3} = \frac{1}{3} \times 180^\circ = 60^\circ$

~~$180^\circ = 180 \times 1^\circ$
 $= 180 \times \frac{\pi}{180}$~~

08 $\frac{D}{90} = \frac{9}{100}$

$\frac{D}{90} = \frac{180}{100}$

$\Rightarrow D = 162^\circ$

Ans: B

09 $18^\circ 30' 42''$

$= 18^\circ + 30' + 42''$

$= 18^\circ + \left(\frac{30}{60}\right)^\circ + \left(\frac{42}{3600}\right)^\circ$

$= 18^\circ + 0.5^\circ + 0.0116667^\circ$

$= 18.5116667^\circ$

Ans: A



10. $3.25^\circ = 3^\circ + 0.25^\circ$ (4)

$$= 3^\circ + \left(\frac{25}{100} \times 60 \right)$$

$$= 3^\circ + 15'$$

$$= 3^\circ 15'$$

Ans: B

11. $230^\circ = 230 \times \frac{\pi}{180}$

$$= 1.28 \pi \text{ radians (or)}$$

$$= 4.01 \text{ radian}$$

$\pi = 3.14$

Ans: A, B

12. $\frac{63\pi}{11} = \frac{63}{11} \times 180^\circ$

$$= 1031^\circ$$

Ans: B

13. Statement I:

$$11 \times \frac{\pi}{6} \times \frac{180}{\pi} \text{ radian}$$

$$= 11 \times 30^\circ = 330^\circ \text{ (TRUE)}$$

Statement II: Conceptual (TRUE)

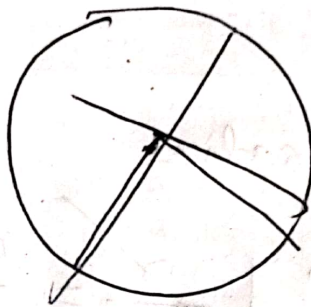
Ans: A

Statement I
 $14) -270 = -\frac{3\pi}{2}$ radians (False)

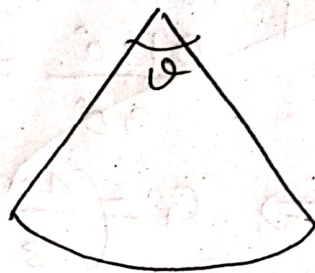
Statement II: Conceptual (True)

(5)
 (AD)

~~15~~



15



$$r = 9 \text{ cm}$$

$$\text{Perimeter} = 36.850$$

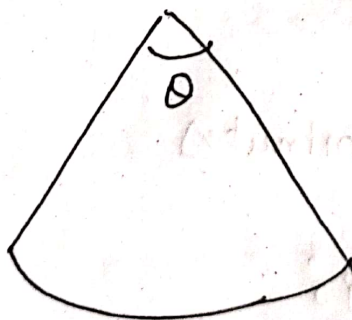
$$2r + \text{arc length} = 36.850$$

$$2r + r\theta = 36.850$$

$$\Rightarrow 2 \times 9 + 9 \times \theta = 36.850$$

$$\Rightarrow \theta = 2.094 \text{ radians} \quad \text{Ans: B}$$

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$$r = 9 \text{ cm}$$

$$\text{Perimeter} = 36.850$$

$$\theta = 2.094 \text{ radians}$$

$$= 2.094 \times \frac{180}{\pi} \text{ degree}$$

$$= 119.78^\circ = 120^\circ (\text{approx})$$

Ans: C

$$17. \quad \frac{\pi}{12} \times \frac{180}{\pi} = 15^\circ$$

Ans: 15° (6)

$$18. \quad \frac{\pi}{5} \text{ radians} = \frac{\pi^c}{5} \times \frac{180^\circ}{\pi} = 36^\circ$$

Ans: 36°

~~$$19. a) 1^\circ = 0.175 \text{ radians}$$~~

~~$$b) 120^\circ = 120 \times 1^\circ$$~~

~~$$= 120 \times 1^\circ$$~~

~~$$\frac{D}{90} = \frac{G}{100}$$~~

~~$$\frac{120^\circ}{90^\circ} = \frac{G}{100}$$~~

~~$$\Rightarrow G = \left(\frac{400}{3}\right)^\circ$$~~

$$19. a) 1^\circ = 0.175 \text{ radians}$$

$$b) \frac{D}{90} = \frac{G}{100}$$

$$\Rightarrow \frac{120}{90} = \frac{G}{100} \Rightarrow G = \left(\frac{400}{3}\right)^\circ$$

$$c) 1 \text{ grade} = 100 \text{ minutes}$$

$$d) 100 \text{ grades} = 90^\circ$$

Ans: S, P, Q, R

20.

$$a) 60^\circ = \frac{\pi}{3}$$

⑦

$$b) 30^\circ = \frac{\pi}{6}$$

$$c) 45^\circ = \frac{\pi}{4}$$

$$d) 90^\circ = \frac{\pi}{2}$$

Ans: q, p, s, r

20. a) $60^\circ = \frac{\pi}{3}$

(1)

b) $30^\circ = \frac{\pi}{6}$

c) $45^\circ = \frac{\pi}{4}$

d) $90^\circ = \frac{\pi}{2}$

Ans: q, s, s, r

LEARNER'S TASK

Ques

01. arm

Ans: A

02. π radians $= \frac{1}{2}$ right angle.

Ans: C

03. $1195^\circ = 3 \times 360^\circ + 115^\circ$, $115^\circ \in Q_2$
 $\therefore 1195^\circ \in Q_2$

Ans: B

04. Conceptual

Ans: A

05. Conceptual

Ans: B

06. Conceptual

Ans: B

07. $\frac{\pi}{8} = \frac{180^\circ}{8} = \frac{45}{2} = 22.50^\circ$

Ans: D

08. $\frac{C}{\frac{\pi}{2}} = \frac{G}{100}$

$\Rightarrow \frac{\frac{\pi}{8}}{\frac{\pi}{2}} = \frac{G}{100}$

$\Rightarrow \frac{1}{4} = \frac{G}{100}$

$G = \frac{100}{4}$

$G = 25$

Ans: B

$$\Rightarrow \frac{\left(\frac{\pi}{4.2}\right)}{\left(\frac{\pi}{2}\right)} = \frac{D}{90}$$

$$= \frac{1}{2.1} = \frac{D}{90}$$

$$0.9$$

$$0.9 \times 57.16^\circ$$

09. $\frac{\pi}{4.2} = \frac{180^\circ}{4.2} = \frac{180 \times 10}{42} = \frac{300^\circ}{7}$ (8)

10. $\frac{\pi}{2} = \frac{D}{90}$ | $D = \frac{0.9 \times 90 \times 2}{3.14}$

$\Rightarrow \frac{0.9}{\left(\frac{\pi}{2}\right)} = \frac{D}{90}$ | $D = 51.6^\circ$ (approx) Ans: B

JEE MAINS LEVEL

01. $\frac{9}{5} \pi = \frac{9}{5} \times 180^\circ = 324^\circ$ Ans: A

02. $-300^\circ = -300 \times \frac{\pi}{180} = -\frac{5\pi}{3}$ Ans: B

03. $43^\circ + 6' + 9''$

$$= 43^\circ + \left(\frac{6}{60}\right)^\circ + \left(\frac{9}{3600}\right)^\circ$$

$$= 43^\circ + \left(\frac{1}{10}\right)^\circ + \left(\frac{1}{400}\right)^\circ$$

$$= \frac{17200 + 40 + 1}{400}$$

$$= \frac{17241}{400}$$

$$= 43.1025^\circ$$

$$= 43.1025 \times \frac{\pi}{180}$$

$$= 0.752 \text{ rad}$$

Ans: A

$$05) 3\pi = 3 \times 180^\circ \\ = 540^\circ$$

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Ans: B

$$05) \frac{7\pi}{6} + \frac{12\pi}{6} = \frac{19\pi}{6} \quad \Rightarrow G = \frac{19}{3} \times 100 \\ \frac{C}{\frac{\pi}{2}} = \frac{G}{100} \quad G = 633.33^\circ \\ \Rightarrow \frac{(\frac{19\pi}{6})}{(\frac{\pi}{2})} = \frac{G}{100}$$

$$06) \frac{D}{90} = \frac{G}{100} \quad G = 300^\circ \\ \frac{270}{90} = \frac{G}{100}$$

Ans: D

$$07) \frac{C}{\frac{\pi}{2}} = \frac{G}{100} \quad C = \frac{360}{100} \times \frac{\pi}{2} \\ \Rightarrow \frac{C}{\frac{\pi}{2}} = \frac{360}{100} \quad C = \frac{9\pi}{5} \quad \text{Ans: B}$$

$$08) G - D = \frac{200C}{\pi} - \frac{180C}{\pi} = \frac{20C}{\pi}$$

$$09) \frac{C}{\frac{\pi}{2}} = \frac{D}{90} \quad C = \frac{135^\circ}{90} \times \frac{\pi}{2} \\ \Rightarrow \frac{C}{\frac{\pi}{2}} = \frac{135^\circ}{90} \quad C = \frac{3\pi}{4}$$

$$10) 60^\circ = 60 \times \frac{\pi}{180} \\ = 0.3\pi \text{ rad.}$$

Ans: B

11.

$$90^\circ = \frac{\pi}{2} \text{ or } 1.571 \text{ rad}$$

Ans: C, D

(10)

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Statement I: $100^\circ = \frac{\pi}{2}^c$ (True)

Statement II: Conceptual (True)

Ans: A

13

$$\pi^c = 180^\circ$$

Ans: D

14

$$1 \text{ grade} = 100 \text{ minutes}$$

Ans: 100

15.

a) $144^\circ = 160^g$

b) $100^g = \frac{\pi}{2}^c$

c) $3^c = \frac{3}{\pi} \times 200^g$

d) $1 \text{ radian} = \frac{2}{\pi}$ of a right angle Ans: s, p, r, r

$\Rightarrow$ THE END $\Leftarrow$