

FOUNDATION⁺

①

Class: VI, MATHEMATICS

7. POLYGONS

TEACHING TASK (JEE MAINS)

01. Let the no. of sides be n .

$$\frac{360^\circ}{n} = 36 \Rightarrow n = 10$$

Ans: C

02. $(2n-4) \times 90^\circ = 16 \times 90^\circ$

$$\Rightarrow n = 10$$

Ans: D

03. $\frac{360^\circ}{n} = 72^\circ \Rightarrow n = 5$

Ans: C

~~04. $\frac{360^\circ}{n} = 1\frac{3}{4} \times 90^\circ$~~

~~$\Rightarrow \frac{360^\circ}{n} = \frac{7}{4} \times 90^\circ$~~

04. $\frac{(2n-4) \times 90^\circ}{n} = 1\frac{3}{4} \times 90^\circ$

$$\Rightarrow \frac{2n-4}{n} = \frac{7}{4} \Rightarrow n = 16$$

Ans: D

05. $(2n-4) \times 90^\circ = 5 \times 360^\circ$

$$\Rightarrow 2n-4 = 20$$

$$\Rightarrow n = 12$$

Ans: C

06. $(2n-4) \times 90^\circ = 1620$

$$\Rightarrow 2n-4 = 18 \Rightarrow n = 11$$

Ans: B

07. Circle

Ans: C

08

$$n = 9$$

$$\text{Each interior angle} = \frac{(2n-4) \times 90^\circ}{n}$$

$$= \frac{(2 \times 9 - 4) \times 90^\circ}{9}$$

$$= 140^\circ$$

Ans: B

09.

$$(2n-4) \times 90^\circ = 910^\circ$$

$$\Rightarrow (2n-4) = \frac{91}{9} \rightarrow \text{not possible}$$

Ans: D

10

$$n = 6$$

$$\text{Each exterior angle} = \frac{360^\circ}{6} = 60^\circ$$

Ans: A

JEE ADVANCED

11.

$$n = 8$$

$$\text{Each exterior angle} = \frac{360^\circ}{n} = \frac{360^\circ}{8} = 45^\circ$$

$$\text{or } \frac{1}{2} \text{ right angle} \propto \frac{1}{4} \text{ straight angle}$$

Ans: A, B, D

12.

$$\frac{n(n-3)}{2} = 54$$

$$\Rightarrow n(n-3) = 108$$

$$\text{Clearly } n = 12 \text{ or } \frac{2}{9} \times 54$$

Ans: B, C

13.

Statement I: $n = 6$.

$$\text{Each interior angle} = \frac{(2n-4) \times 90^\circ}{n}$$

$$= \frac{(2 \times 6 - 4) \times 90^\circ}{6} = 120^\circ \text{ (True)}$$

Ans: A

Statement II: Conceptual (True)

14. Statement I: $n=8$

$$\text{No. of diagonals} = \frac{n(n-3)}{2} = \frac{8(8-3)}{2} = 20 \text{ (True)}$$

Ans: A

Statement II: Conceptual (True)

15. Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

16. Assertion: $n=12$

$$\begin{aligned}\text{Sum of interior angles} &= (2n-4) \times 90^\circ \\ &= (2 \times 12 - 4) \times 90^\circ \\ &= 1800^\circ \text{ (True)}\end{aligned}$$

Ans: A

Reason: Conceptual (True)

17. Let the number of sides be n

two angles are 90°

remaining sides are $(n-2)$, each angle is 120°

$$\text{Sum of the interior angles} = (2n-4) \times 90^\circ$$

$$\therefore 2 \times 90^\circ + (n-2) \times 120^\circ = (2n-4) \times 90^\circ$$

$$\Rightarrow n=5$$

Ans: A

18. $n=5$

$\therefore$ Sum of interior angles

$$\begin{aligned}&= 2 \times 90^\circ + 3 \times 120^\circ \\ &= 180^\circ + 360^\circ = 540^\circ\end{aligned}$$

Ans: B

19. $n=12$

$$\begin{aligned}\text{Sum of interior angle} &= (2n-4) \times 90^\circ \\ &= (2 \times 12 - 4) \times 90^\circ \\ &= 1800^\circ\end{aligned}$$

Ans: A



20 Each interior angle = $\frac{1800}{12} = 150^\circ$ (4)
Ans: A

21. $n=5$
No. of diagonals = $\frac{n(n-3)}{2} = \frac{5(5-3)}{2} = 5$
Ans: 5

22 $\left| \frac{(2n-4) \times 90^\circ}{n} - \frac{360^\circ}{n} \right| = 100^\circ$
 $\Rightarrow |180n - 360^\circ - 360^\circ| = 100 \times n$
 $\Rightarrow 180n - 720 = 100n$
 $\Rightarrow 80n = 720^\circ$
 $\Rightarrow n = 9$ Ans: 9

23 a) $\frac{n(n-3)}{2} = 9 \Rightarrow n = 6(S)$
 b) $\frac{n(n-3)}{2} = 14 \Rightarrow n = 7(Q)$
 c) $\frac{n(n-3)}{2} = 20 \Rightarrow n = 8(P)$
 d) $\frac{n(n-3)}{2} = 27 \Rightarrow n = 9(t)$ Ans: S, Q, P, t

24 a) $(2n-4) \times 90^\circ (r)$ | c) $\frac{(2n-4) \times 90^\circ}{n} (t)$
 b) $360^\circ (q)$ | d) $\frac{n(n-3)}{2} (p)$
Ans: r, q, t, p

LEARNERS TASK (CUES)

01. Conceptual Ans: D

02. Conceptual Ans: D

03. Conceptual Ans: B

04.	180°	Ans: A ⁽⁵⁾
05	360°	Ans: B
06	$\frac{n(n-3)}{2}$	Ans: A
07	$(2n-4) \times 90^\circ$	Ans: B
08	$\frac{(2n-4) \times 90^\circ}{n}$	Ans: D
09	Conceptual	Ans: C

JEE MAINS

01.	$n=12$ Each interior = $\frac{(2n-4) \times 90^\circ}{n}$ $= \frac{(2 \times 12 - 4) \times 90^\circ}{12} = 150^\circ$ Each exterior angle = $\frac{360^\circ}{12} = 30^\circ$	Ans: A
02	$n=5$ Sum of interior angles = $(2n-4) \times 90^\circ$ $= (2 \times 5 - 4) \times 90^\circ$ $= 540^\circ$ Greatest angle = $\frac{8}{27} \times 540^\circ = 160^\circ$	Ans: D
03	$x + 2x + (3x + 10) + (4x + 5) + 5x = 360^\circ$ $\Rightarrow 15x + 15 = 360$ $\Rightarrow x = 23^\circ$	Ans: A
04	$n=8$ Each interior angle = $\frac{(2n-4) \times 90^\circ}{n} = \frac{(2 \times 8 - 4) \times 90^\circ}{8} = 135^\circ$	Ans: B

05

$$n=6$$

$$\text{Each exterior angle} = \frac{360^\circ}{6} = 60^\circ$$

Ans. D

06

$$n=6$$

$$\begin{aligned}\text{Sum of interior angles} &= (2n-4) \times 90^\circ \\ &= (2 \times 6 - 4) \times 90^\circ \\ &= 720^\circ\end{aligned}$$

Ans: C

07

$$n=15$$

$$\text{Each exterior angle} = \frac{360^\circ}{15} = 24^\circ$$

Ans D

08

$$\frac{360^\circ}{n} : \frac{(2n-4) \times 90^\circ}{n} = 2:3$$

$$\Rightarrow 2(2n-4) \times 90^\circ = 3 \times 360^\circ$$

$$\Rightarrow 2n-4 = 6$$

$$\Rightarrow n = 5$$

Ans.. A

09

$$(2n-4) \times 90^\circ = 2160^\circ \Rightarrow n=14$$

Ans: B

10.

$$(2n-4) \times 90^\circ = 1440^\circ \Rightarrow n=10, \text{decagon} \quad \text{Ans: C}$$

JEE ADVANCED

11.

$$n=12$$

$$\text{a) Each interior angle} = \frac{(2n-4) \times 90^\circ}{n}$$

$$= \frac{(2 \times 12 - 4) \times 90^\circ}{12} = 150^\circ \checkmark$$

$$\text{B) Each exterior angle} = \frac{360^\circ}{12} = 30^\circ$$

$$\therefore 150 = 5 \times 30 \quad (\text{False})$$

C)

⑦
 C) Sum of interior angles = $(2n-4) \times 90^\circ$
 $= (2 \times 12 - 4) \times 90^\circ$
 $= 1800^\circ$

Sum of Exterior angle = 360°

Given, $1800^\circ = 6 \times 360$ (False)

D) Sum of Exterior angle = $360^\circ \checkmark$

Ans: A, D

12 $n = 8$

A) Each interior angle = $\frac{(2n-4) \times 90^\circ}{n}$
 $= \frac{(2 \times 8 - 4) \times 90^\circ}{8}$
 $= 135^\circ \checkmark$

B) Each exterior angle = $\frac{360^\circ}{n} = \frac{360^\circ}{8} = 45^\circ \checkmark$

C) No. of diagonals = $\frac{n(n-3)}{2} = \frac{8 \times 5}{2} = 20 \checkmark$

D) Sum of interior angle = $(2n-4) \times 90^\circ$
 $= (2 \times 8 - 4) \times 90^\circ$
 $= 1080^\circ \checkmark$ Ans: A, B, C, D

13. Statement I: $n = 5$

Sum of interior angles = $(2n-4) \times 90^\circ$
 $= (2 \times 5 - 4) \times 90^\circ$
 $= 540^\circ$ (False)

Ans: C

Statement II: Conceptual (True)

14 Statement I: $n = 10$.
 Each interior angle = $\frac{(2n-4) \times 90^\circ}{n} = \frac{(2 \times 10 - 4) \times 90^\circ}{10}$
 $= 144^\circ$ (True)

Statement II: Conceptual (True)

Ans: A

15	<u>Assertion:</u> Conceptual (True) <u>Reason:</u> Conceptual (True)	(8) Ans: A
16	<u>Assertion:</u> Conceptual (True) <u>Reason:</u> Conceptual (True)	Ans: A
17	Concave polygon	Ans: C
18	Yes	Ans: A
19.	$n = 10$ Sum of interior angles = $(2n-4) \times 90^\circ$ $= (2 \times 10 - 4) \times 90^\circ = 1440^\circ$	Ans: A
20	360°	Ans: C
21.	$\frac{(2n-4) \times 90^\circ}{n} = 135^\circ \Rightarrow n = 8$	Ans: 8
22	$\frac{(2n-4) \times 90^\circ}{n} = 150^\circ \Rightarrow n = 12$	Ans: 12
23	a) $\frac{360^\circ}{n} = \frac{1}{3} \left(\frac{(2n-4) \times 90^\circ}{n} \right) \Rightarrow n = 8 (S)$ b) No. of sides = 4 (P) c) $\frac{(2n-4) \times 90^\circ}{n} = 2 \times \frac{360^\circ}{n} \Rightarrow n = 6 (Q)$ d) $(2n-4) \times 90^\circ = 360^\circ \Rightarrow n = 4 (P)$	Ans: S, P, Q, P
24	a) $60^\circ (P)$ b) $90^\circ (Q)$ c) $\frac{(2n-4) \times 90^\circ}{n} = \frac{(2 \times 5 - 4) \times 90^\circ}{5} = 108^\circ (R)$ d) $\frac{(2 \times 6 - 4) \times 90^\circ}{6} = 120^\circ (S)$	Ans: P, Q, R, S
$\Rightarrow$ THE END $\Leftarrow$		