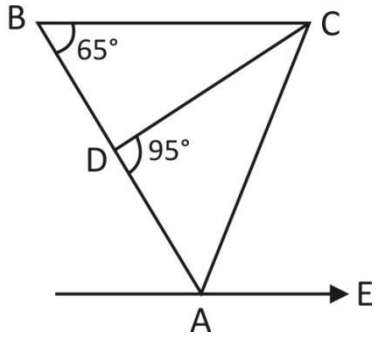
Geometry Questions for CDS, SSC & Railways Exams

Lines & Angles Quiz 3

Directions: Kindly study the following questions carefully and choose the right answer:

1. In the figure given below, ABC is a triangle. BC is parallel to AE. If BC = AC, then what is the value of ∠CAE?



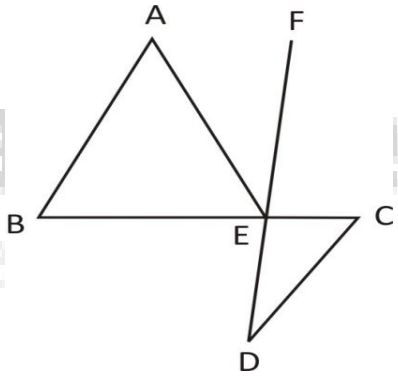
A. 20°

B. 30°

C. 40°

D. 50°

2. In the figure given below, AB is parallel to CD. ∠ABC = 65°, ∠CDE = 15° and AB = AE. What is the value of ∠AEF?



A. 30°

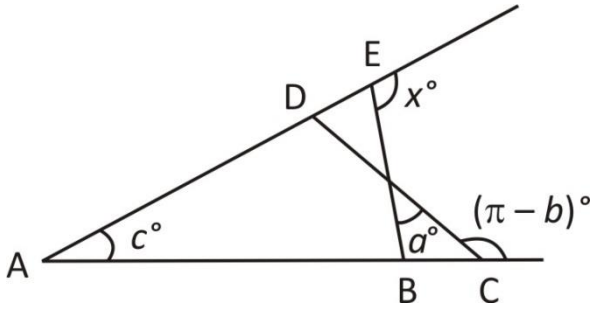
B. 35°

C. 40°

D. 45°

3. The angles x°, a°, c° and (π – b)° are indicated in the figure given below

Which one of the following is correct?



A. x° = a° + c° – b°

B. x° = b° – a° – c°

C. x° = a° + b° + c°

D. x° = a° – b° + c°

4. Consider the following statements

I. The locus of points which are equidistant from two parallel lines is a line parallel to both of them and drawn mid-way between them.

II. The perpendicular distance of any point on this locus line from two original parallel lines are equal. Further, no point outside this locus line has this property.

Which of the above statements is/are correct?

A. Only I B. Only II C. Both I and II D. Neither I nor II

5. A wheel makes 12 revolutions per min. The angle in radian described by a spoke of the wheel in 1 s is:

A. $\frac{5\pi}{2}$ B. $\frac{2\pi}{5}$ C. $\frac{3\pi}{5}$ D. $\frac{4\pi}{5}$

6. If the arms of one angle are respectively parallel to the arms of another angle, then the two angles are

A. Neither equal nor supplementary

B. not equal but supplementary

C. equal but not supplementary

D. Either equal or supplementary

7. In a Δ ABC, $\frac{1}{2}\angle A + \frac{1}{3}\angle C + \frac{1}{2}\angle B = 80°$, then what is the value of ∠C?

A. 35° B. 40° C. 60° D. 70°

8. The complement angle of 80° is

A. $\frac{18}{\pi}$ radian B. $\frac{5\pi}{9}$ radian C. $\frac{\pi}{18}$ radian D. $\frac{9}{5\pi}$ radian

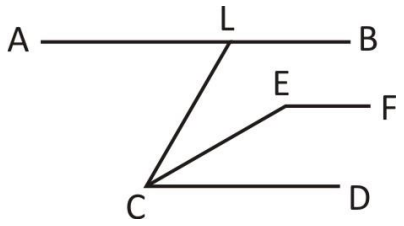
9. In the given figure AB || CD, ∠ALC = 60° and EC is the bisector of ∠LCD. If EF || AB then the value of ∠CEF is

A. 120°

B. 140°

C. 150°

D. None of these



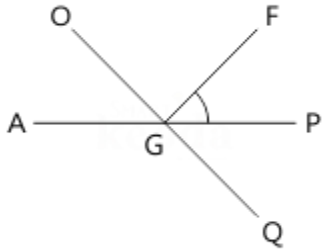
10. In the given figure lines AP and OQ intersect at G If ∠AGO + ∠PGF = 70° and ∠PGQ = 40°. Find the angle value of ∠PGF.

A. 31°

B. 35°

C. 30°

D. 20°



Correct Answers:

1	2	3	4	5	6	7	8	9	10
D	B	C	C	B	B	C	C	C	C

Explanations:

1.

An angle which is greater than 180° but less than 360° is called a reflex

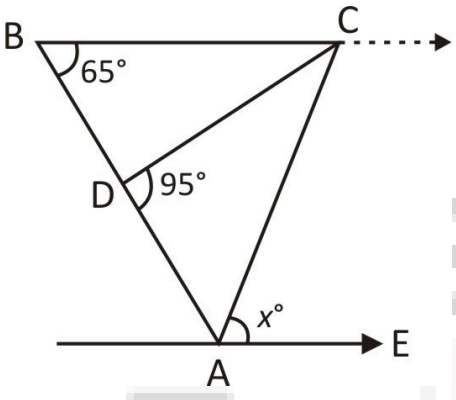
Given that, BC || AE

∠CBA + ∠EAB = 180°

⇒ ∠EAB = 180° – 65° = 115°

∵ BC = AC

Hence, ΔABC is an isosceles triangle.



⇒ ∠CBA = ∠CAB = 65°

Now, ∠EAB = ∠EAC + ∠CAB

⇒ 115° = x + 65° ⇒ x = 50°.

Hence, option D is correct.

2.

Given that,

∠ABC = 65° and ∠CDE = 15°

Here, ∠ABC + ∠TCB = 180° (∵ AB || CD)

∠TCB = 180° – ∠ABC

∴ ∠TCB = 180° – 65° = 115°

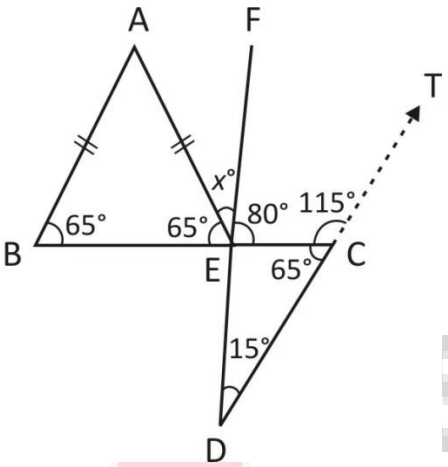
∵ ∠TCB + ∠DCB = 180° (Linear pair)

∴ ∠DCB = 65°

Now, in ΔCDE

∠CED = 180° – (∠ECD + ∠EDC) (∵ ∠ECD = ∠BCD)

= 180° – (– 65° + 15°) = 100°



∵ ∠DEC + ∠FEC = 180°

⇒ ∠FEC = 180° – 100° = 80°

Given that, AB = AE.

i.e. ΔABE an isosceles triangle.

∴ ∠ABE = ∠AEB = 65°

∵ ∠AEB + ∠AEF + ∠FEC = 180° (straight line)

⇒ 65° + x° + 80° = 180°

∴ x° = 180° – 145° = 35°.

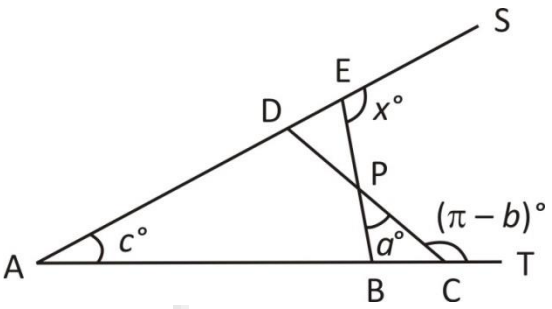
Hence, option B is correct.

3.

Correct Option: C

$\angle PCT + \angle PCB = \pi$ (Linear pair)

$\angle PCB = \pi - (\pi - b°) = b°$ ..... (i)



In ΔBPC,

$\angle PCB + \angle BPC + \angle PBC = \pi$

$\angle PBC = \pi - \angle PCB - \angle BPC = \pi - b° - a°$ ..... (ii)

$\because \angle ABE + \angle EBC = \pi$ ($\because \angle PBC = \angle EBC$) (linear pair)

$\angle ABE = \pi - \angle PBC = \pi - (\pi - b° - a°) = a° + b°$ ...(iii)

Now, in ΔABE

Sum of two interior angles = Exterior angle

$\angle EAB + \angle ABE = \angle BES \Rightarrow c° + b° + a° = x°$

$\therefore x° = a° + b° + c°.$

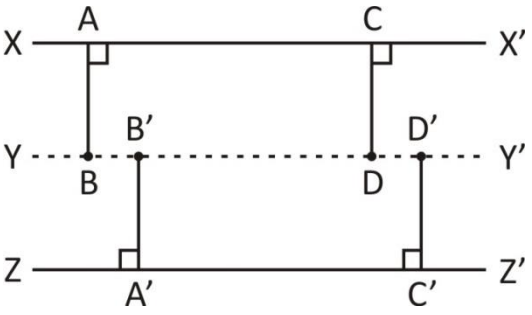
Hence, option C is correct.

4.

Correct Option: C

Statements I and II are both true, because the locus of points which are equidistant from two parallel lines is a line parallel to both of them and draw mid way between them.

Also, it is true that the perpendicular distances of any point on this locus line from two original parallel lines are equal. Further, no point outside this locus line has this property.



Hence, option C is correct.

5.

In 1 min = 60 s distance travelled by the wheel

= 12 × Its circumference

= 12 × 2πr

$\therefore$ In 1 s distance travelled by the wheel = $\frac{12 \times 2\pi r}{60} = \frac{2}{5}\pi r$

$\because$ Angle = $\frac{\text{Arc}}{\text{Radius}} = \frac{2/5\ \pi r}{r} = \frac{2\pi}{5}$

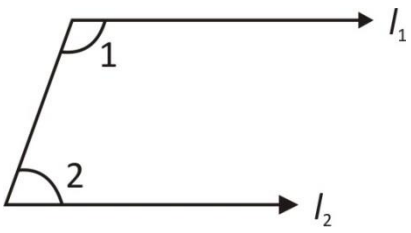
Which is the required angle.

Hence, option B is correct.

6.

If the arms of one angle are respectively parallel to the arms of another angle, then the two angles are not equal but supplementary.

Ex.



If l1 || l2 ⇒ ∠1 + ∠2 = 180° (Supplementary)

Hence, option B is correct.

7.

Given that,

$\frac{1}{2}\angle A + \frac{1}{3}\angle C + \frac{1}{2}\angle B = 80° \Rightarrow 3\angle A + 2\angle C + 3\angle B = 480°$

$\Rightarrow 3(\angle A + \angle B) + 2\angle C = 480°$ ....(i)

Also, in ΔABC,

$\angle A + \angle B + \angle C = 180°$

On multiplying both sides L.H.S. & R.H.S. by 3, we get

$3(\angle A + \angle B) + 3\angle C = 540°$ ..... (ii)

On subtracting Eq. (i) from Eq. (ii), we get

$\angle C = 60°$.

Hence, option C is correct.

8.

Correct Option: C

Complementary angles: Complementary angles are angle pairs whose measures sum to one right angle (90°).

So, the required angle will be 10°

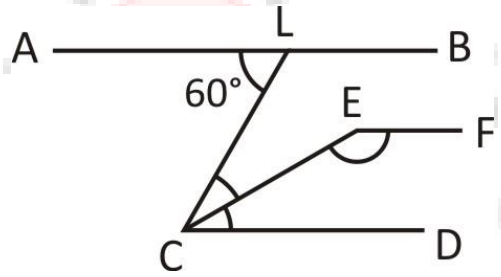
180° = π radian

$1° = \frac{\pi}{180}$

$\therefore \quad 10° = \frac{\pi \times 10}{180} = \frac{\pi}{18}$

Hence, option C is correct.

9.



$\angle ALC = \angle LCD = 60°$ [∵ Alternate angles]

EC is the bisector of ∠LCD

$\therefore \quad \angle ECD = \frac{1}{2} \times \angle LCD = \frac{1}{2} \times 60° = 30°$

$\angle CEF + \angle ECD = 180°$ [∵ Pair of interior angles]

$\angle CEF + 30° = 180°$

$\angle CEF = 180° - 30° = 150°$

Hence, option C is correct.

10.

As, AP is a straight line and rays GO and GF stands on it.

$\therefore \angle AGO + \angle OGF + \angle PGF = 180°$

$\Rightarrow (\angle AGO + \angle PGE) + \angle OGF = 180°$

$\Rightarrow 70° + \angle OGF = 180°$

$\Rightarrow \angle OGF = 180° - 70°$

$\Rightarrow \angle OGF = 110°$

As, OQ is a straight line, rays GF and GP stands on it.

$\angle OGF + \angle PGF + \angle PGQ = 180°$

Putting value of $\angle OGF$ & $\angle PGQ$

$110° + \angle PGF + 40° = 180°$

$\angle PGF = 180° - 150° = 30°$

Hence, option C is correct.