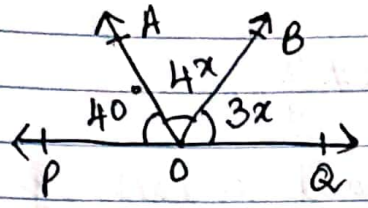
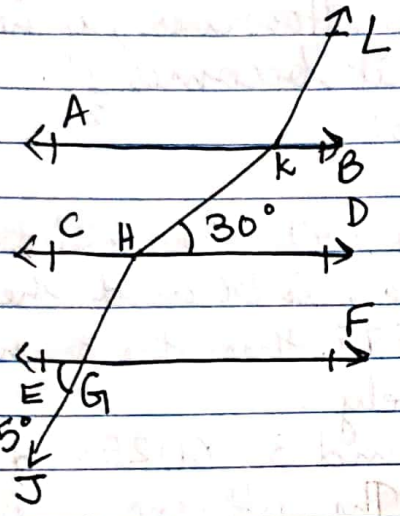
IX Elite work – 10 (Lines and Angles – MCQs)

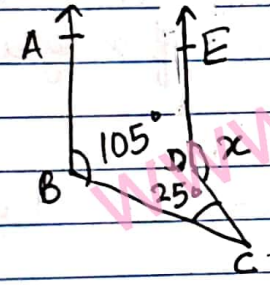
1) If one of the angles of a triangle is 130°, then the angle between the bisectors of the other two angles can be:
(a) 50° (b) 130° (c) 155° (d) 160°

2) 

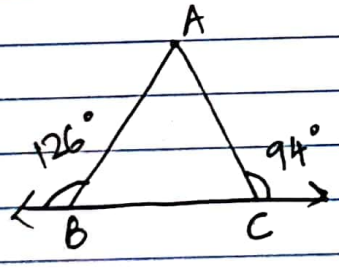
POQ is a line. The value of x is
(a) 20° (b) 18° (c) 15° (d) 12°

3) 

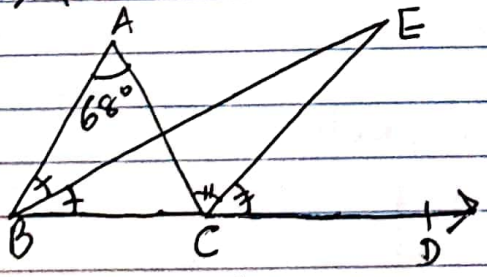
AB || CD || EF and JH || KL.
∠KHD = 30°
∠EGJ = 65°
Then, ∠HKL =
(a) 90° (b) 95° (c) 100° (d) 145°

4) 

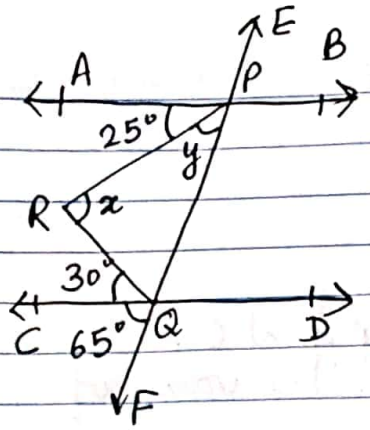
AB || ED, ∠ABC = 105° and ∠BCD = 25°.
Then, the value of x =
(a) 110° (b) 120° (c) 130° (d) 135°

5) 

The base BC of a △ABC is produced both ways and the measure of exterior angles formed are 94° and 126°. Then, the measure of ∠BAC is
(a) 40° (b) 45° (c) 48° (d) 50°.

6) 

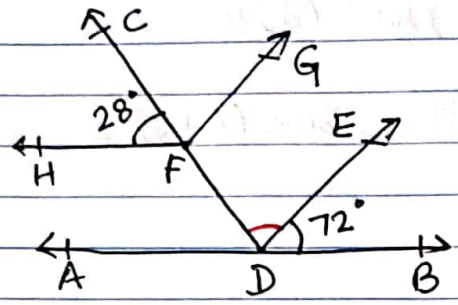
The side BC of △ABC is produced to point D. The bisectors of ∠ABC and ∠ACD meet at a point E.
If ∠BAC = 68°, then measure of ∠BEC =
(a) 35° (b) 34° (c) 32° (d) 30°

7) 

AB || CD. Transversal EF intersects AB at P and CD at Q. If $\angle APR = 25°$, $\angle RQC = 30°$ and $\angle CQF = 65°$, then the measures of angles x and y respectively are:

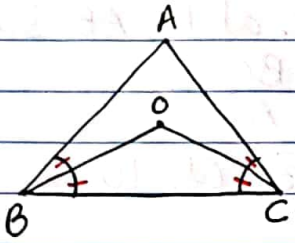
(a) 55°, 40° (b) 50°, 45°

(c) 45°, 50° (d) 35°, 65°

8) 

If AB || HF and DE || FG, then the measure of $\angle FDE$ is

(a) 80° (b) 90° (c) 105° (d) 110°

9) 

BO and CO, the bisectors of $\angle B$ and $\angle C$ respectively of $\triangle ABC$, meet at O. If $\angle A = 60°$, then the measure of $\angle BOC$ =

(a) 90° (b) 100° (c) 110° (d) 120°

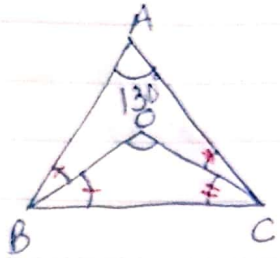
10) If the supplement of an angle is four times of its complement, then the angle is

(a) 60° (b) 70° (c) 75° (d) 80°

IX

Elite work – 10 (Lines and Angles – answers)

1)



To find: $\angle BOC$

$\angle A + \angle B + \angle C = 180^\circ$ (angle sum property)

$\angle B + \angle C = 180^\circ - \angle A$

$\frac{1}{2}(\angle B + \angle C) = 90^\circ - \frac{1}{2}\angle A \rightarrow (i)$

In $\triangle OBC$, $\angle BOC + \angle OBC + \angle OCB = 180^\circ$

$\angle BOC + \frac{1}{2}\angle B + \frac{1}{2}\angle C = 180^\circ$

$\angle BOC + \frac{1}{2}(\angle B + \angle C) = 180^\circ$

$\angle BOC = 180^\circ - \frac{1}{2}(\angle B + \angle C)$

$= 180^\circ - 90^\circ + \frac{1}{2}\angle A$ [from eq: (i)]

$\angle BOC = 90^\circ + \frac{1}{2}\angle A$

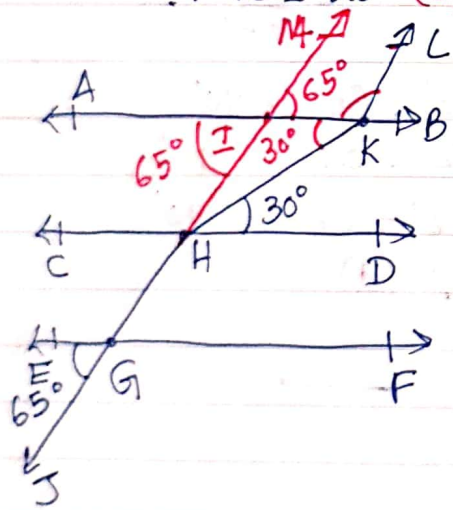
$= 90^\circ + \frac{130^\circ}{2} = 90^\circ + 65^\circ = 155^\circ$ (c)

2) $40^\circ + 4x + 3x = 180^\circ$ (angles on a straight line)

$\Rightarrow 7x = 140^\circ$

$\therefore x = 20^\circ$ (a)

3)



Construction: draw $MH \parallel LK$

$\angle AIH = \angle EGJ = 65^\circ$ (corresponding angles)

$\angle AIH = \angle MIK = 65^\circ$ (V.O.A)

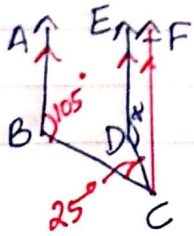
$\angle MIK + \angle LKI = 180^\circ$ (cointerior angles)

$\therefore \angle LKI = 180^\circ - 65^\circ = 115^\circ$

Also, $\angle KHD = \angle IKH = 30^\circ$ (alternate interior angles)

$\therefore \angle HKL = 30^\circ + 115^\circ = 145^\circ$ (d)

4)



Construction: draw $CF \parallel DE \parallel AB$

Since $AB \parallel CF$, $\angle ABC + \angle BCF = 180^\circ$

$\therefore \angle BCF = 180^\circ - 105^\circ = 75^\circ$

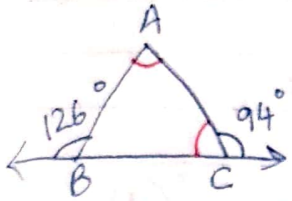
Thus, $\angle DCF = 75^\circ - 25^\circ = 50^\circ$

Then, $DCF + \angle EDC = 180^\circ$ (Cointerior angles)

$\angle EDC = 180^\circ - 50^\circ = 130^\circ$

$\therefore x = 130^\circ$ (c)

5)



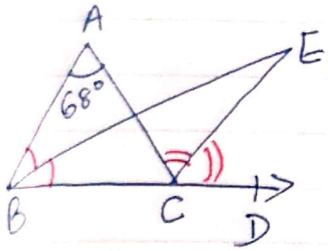
$\angle ACB = 180^\circ - 94^\circ$ (linear pair)

$= \underline{86^\circ}$

Using exterior angle property in $\triangle ABC$, $\angle BAC + \angle ACB = 126^\circ$

$\therefore \angle BAC = 126^\circ - 86^\circ = 40^\circ$ (a)

6)



Using exterior angle property in $\triangle ABC$,

$\angle A + \angle B = \angle ACD$

$68^\circ + \angle B = \angle ACD$

$\angle B = \angle ACD - 68^\circ$

$\frac{1}{2}\angle B = \frac{1}{2}\angle ACD - 34^\circ$

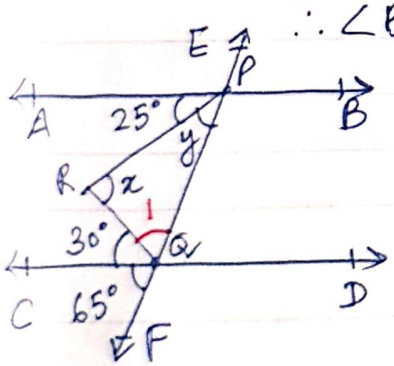
$\therefore \angle EBC = \angle ECD - 34^\circ$

In $\triangle EBC$, $\angle ECD = \angle EBC + \angle BEC$

$\Rightarrow \angle ECD = \angle ECD - 34^\circ + \angle BEC$

$\therefore \angle BEC = \underline{34^\circ}$ (b)

7)



$\angle CQF = \angle APQ = 65^\circ$ (corresponding angles)

$\therefore y = 65^\circ - 25^\circ = 40^\circ$

$65^\circ + 30^\circ + \angle 1 = 180^\circ$ (angles on a straight line)

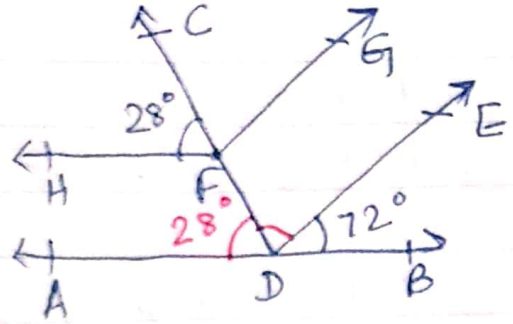
$\angle 1 = 180^\circ - 95^\circ = 85^\circ$

Using angle sum property in $\triangle PQR$, $40^\circ + x + 85^\circ = 180^\circ$

$x = 180^\circ - 125^\circ$

$= 55^\circ$ (a)

8)

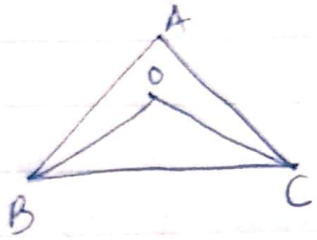


$\angle HFC = \angle ADF = 28°$ (corresponding angles)

$28° + \angle FDE + 72° = 180°$ (angles on a straight line)

$\therefore \angle FDE = 180° - 100° = 80°$ (a)

9)



$\angle BOC = 90° + \frac{1}{2}\angle A$

$= 90° + 30° = 120°$ (d)

10) Let the angle be x.

Then $180° - x = 4(90° - x)$

$= 360° - 4x$

$4x - x = 360° - 180°$

$3x = 180°$

$x = 60°$ (a)