

Mathematics

Chapter 14: Practical Geometry



Important Questions

Multiple Choice Questions:

Question 1. A line segment \overline{TP} is bisected at I. What is the measure of \overline{TI} ?

- (a) $\frac{1}{2}\overline{TP}$
- (b) \overline{IP}
- (c) \overline{TP}
- (d) $\frac{1}{3}\overline{TP}$

Question 2. Which of the following can be drawn on a piece of paper?

- (a) A line
- (b) A line segment
- (c) A ray
- (d) A plane

Question 3. At 7 a.m. the angle between the Sun's ray and the ground at a point is 43° . What would be the angle at 10 a.m.?

- (a) 40°
- (b) 90°
- (c) Between 43° and 90°
- (d) Greater than 90°

Question 4. Identify the uses of a ruler.

- (a) To draw a line segment of a given length
- (b) To draw a copy of a given segment.
- (c) To draw a diameter of a circle.
- (d) All the above.

Question 5. \overline{XY} bisects $\angle AXB$. If $\angle YXB = 37.5^\circ$, what is the measure of $\angle AXB$?

- (a) 37.5°
- (b) 74°
- (c) 64°
- (d) 75°

Question 6. X and Y are two distinct points in a plane. How many lines can be drawn passing through both X and Y?

- (a) 0

- (b) 1
- (c) Only 2
- (d) Infinitely many

Question 7. Lines a, b, p, q, m, n and x have a point P common to all of them. What is the name of P?

- (a) Point of concurrence
- (b) Point of intersection
- (c) Common point
- (d) Distinct point

Question 8. If two lines have only one point in common, what are they called?

- (a) Parallel lines
- (b) Intersecting lines
- (c) Perpendicular lines
- (d) Transversal

Question 9. Two lines are said to be perpendicular to each other when they meet at ____ angle.

- (a) 180°
- (b) 90°
- (c) 60°
- (d) 360°

Question 10. How do you draw a 90° angle?

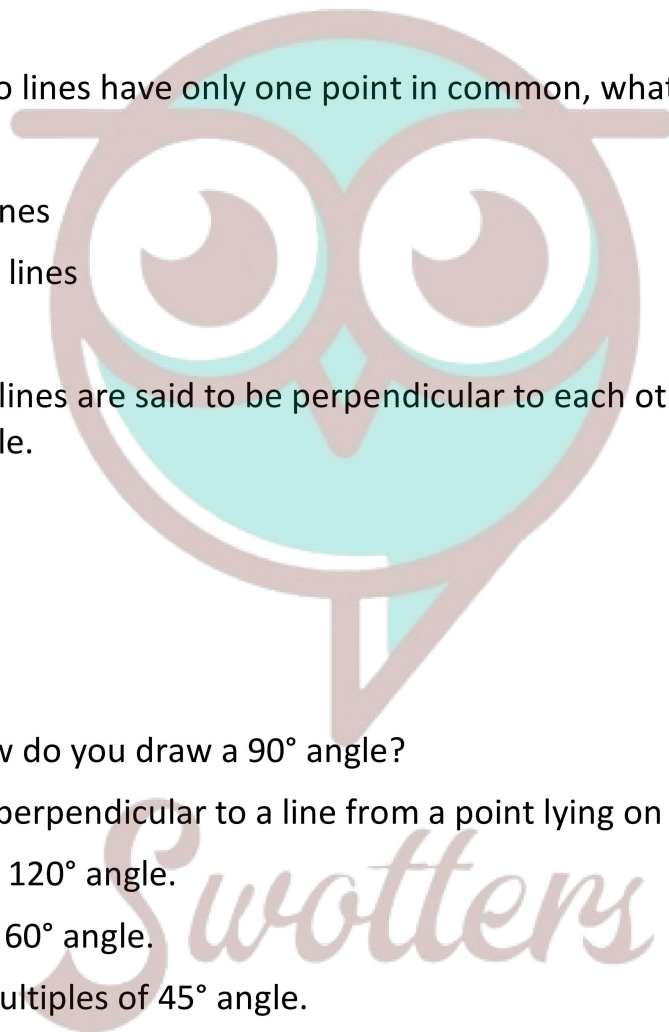
- (a) By drawing a perpendicular to a line from a point lying on it.
- (b) By bisecting a 120° angle.
- (c) By bisecting a 60° angle.
- (d) By drawing multiples of 45° angle.

Question 11. Angles of set squares are 45, 90 and ____.

- (a) 60
- (b) 75
- (c) 30
- (d) 90

Question 12. A _____ is the longest chord of a circle.

- (a) diameter
- (b) radius



- (c) None of these
- (d) chord

Question 13. If the radius of a circle is 8.5 cm, then the diameter of the circle is _____.

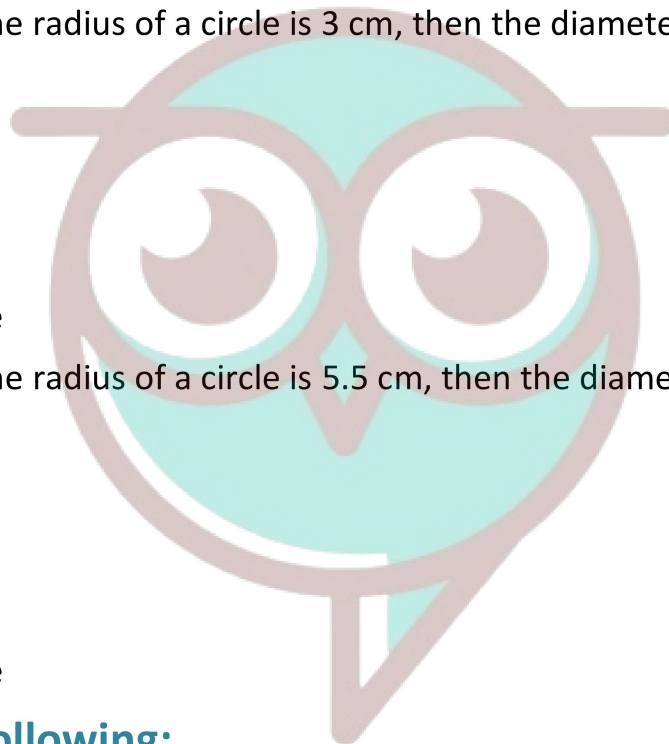
- (a) 17 cm
- (b) 12 cm
- (c) 8.5 cm
- (d) None of these

Question 14. If the radius of a circle is 3 cm, then the diameter of the circle is _____.

- (a) 1.5 cm
- (b) 6 cm
- (c) 3 cm
- (d) None of these

Question 15. If the radius of a circle is 5.5 cm, then the diameter of the circle is _____.

- (a) 11 cm
- (b) 5.5 cm
- (c) 12 cm
- (d) None of these



Match The Following:

	Column I		Column II
1.	The line which divides a line segment into two equal halves and perpendicular to it is called	A.	perpendicular lines
2.	The line which divides an angle into two equal angles is called	B.	parallel lines
3.	The lines which intersect each other at 90o are called	C.	perpendicular bisector
4.	Two lines which are parallel to the same line are called	D.	angle bisector

Fill in the blanks:

1. The image of points A and B in the line l are P and Q respectively then $\overline{PQ} =$ _____.
2. To bisect a line segment of length 5cm, the opening of the compass

should be more than half of _____.

3. If an angle of measure 90° is bisected twice the angle so obtained measures _____.
4. In an isosceles ΔPQR , the bisector of $\angle Q$ and $\angle R$ meet at O. If $\angle QOR = 140^\circ$, then $\angle P =$ _____.

True /False:

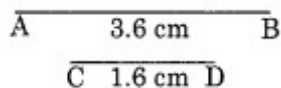
1. Two line segments are compared in terms of their lengths.
2. When a ray makes one complete rotation, the measure of angle formed is 90° .
3. With the help of compasses we can draw 80° .
4. To construct an angle of $37\frac{1}{2}^\circ$, we can bisect 75° .

Very Short Questions:

1. If an angle of 110° is bisected, find the measure of each angle formed.
2. Draw two line segments which are perpendicular to each other using set squares.
3. Construct an angle of 60° using compass and ruler.
4. Construct \overline{PQ} of length 6cm. From this cut off \overline{PR} of length \overline{PR} of length 4.5cm. Measure \overline{QR} .
5. Draw any circle and mark points A, B and C such that:
 - (i) A is on the circle.
 - (ii) B is the interior of the circle.
 - (iii) C is the exterior of the circle

Short Questions:

1. If $AB = 3.6$ and $CD = 1.6$ cm, construct a line segment equal to $\overline{AB} + \overline{CD}$ and measure the total length.



2. Construct a perpendicular to a given line segment at point on it.
3. Construct an angle of 60° and bisect it.
4. Draw an angle of 120° and hence construct an angle of 105° .
5. Using compasses and ruler, draw an angle of 75° and hence construct an angle of $37\frac{1}{2}^\circ$.

Long Questions:

1. With \overline{PQ} of length 6.1cm as diameter draw a circle.
2. Draw a circle with center C and radius 3.4cm. Draw any chord \overline{AB} . Construct the perpendicular bisector of \overline{AB} and examine, if it passes through C.
3. Draw ΔABC . Draw perpendiculars from A, B and C respectively on the sides BC, CA and AB. Are there perpendicular concurrent? (passing through the same points).

Assertion and Reason Questions:

1) Assertion (A): In a triangle D ABC, if $\angle B=90^\circ$, then it is a right angled triangle.

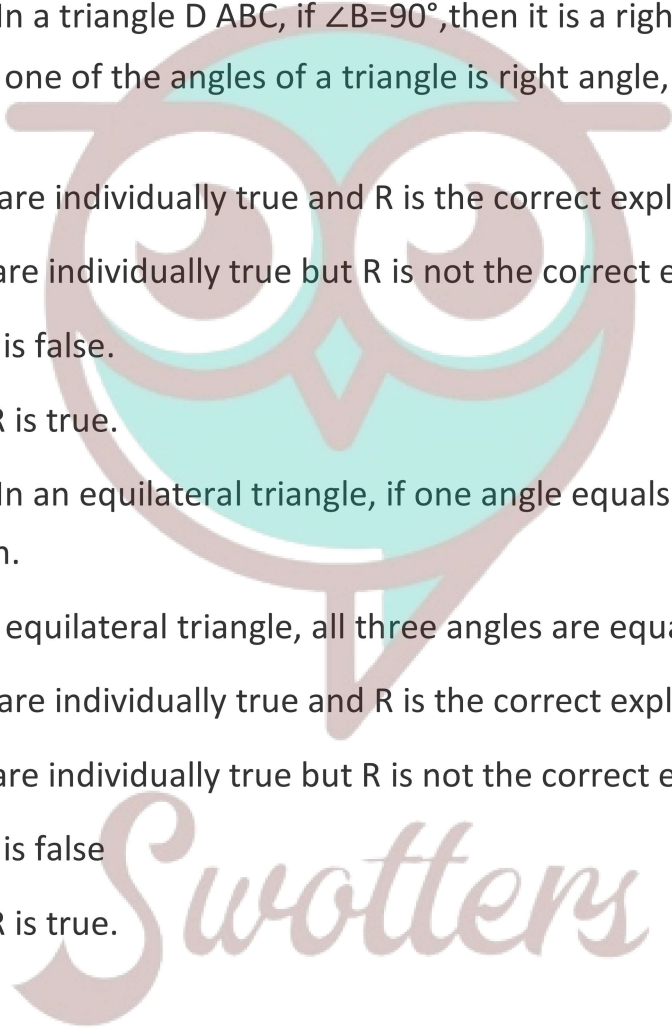
Reason(R): If any one of the angles of a triangle is right angle, then it is a right angled triangle.

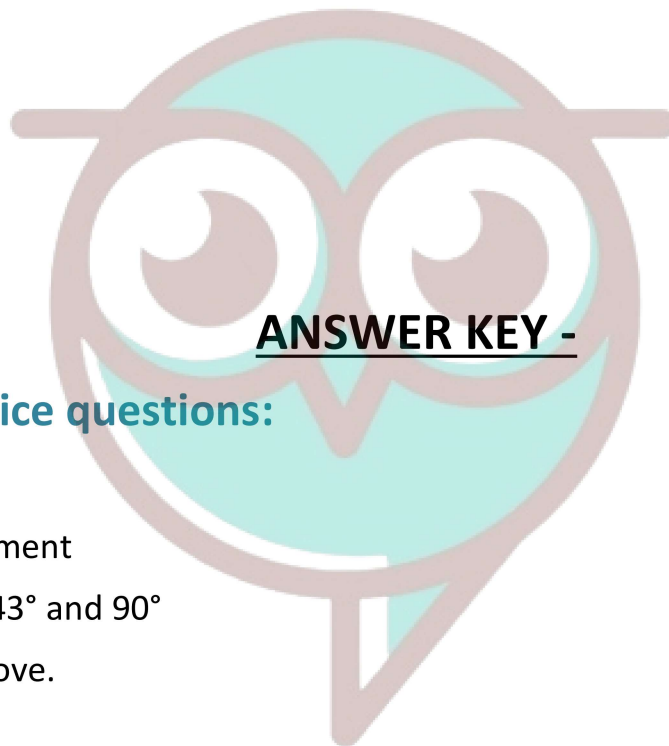
- a) Both A and R are individually true and R is the correct explanation of A:
- b) Both A and R are individually true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

2) Assertion (A): In an equilateral triangle, if one angle equals 60° , then rest of the two are 150° each.

Reason (R): In an equilateral triangle, all three angles are equal.

- a) Both A and R are individually true and R is the correct explanation of A:
- b) Both A and R are individually true but R is not the correct explanation of A.
- c) A is true but R is false
- d) A is false but R is true.





ANSWER KEY -

Multiple Choice questions:

1. (b) \overrightarrow{TP}
2. (b) A line segment
3. (c) Between 43° and 90°
4. (d) All the above.
5. (d) 75°
6. (b) 1
7. (a) Point of concurrence
8. (b) Intersecting lines
9. (b) 90°
10. (a) By drawing a perpendicular to a line from a point lying on it.
11. (B) 75
12. (a) diameter
13. (b) 17 cm
14. (c) 6 cm
15. (d) 11 cm

Match The Following:

	Column I		Column II
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	Column I		Column II
1.	The line which divides a line segment into two equal halves and perpendicular to it is called	C.	perpendicular bisector
2.	The line which divides an angle into two equal angles is called	D.	angle bisector
3.	The lines which intersect each other at 90o are called	A.	perpendicular lines
4.	Two lines which are parallel to the same line are called	B.	parallel lines

Fill in the blanks:

- The image of points A and B in the line l are P and Q respectively then $\overline{PQ} = \underline{\overline{AB}}$.
- To bisect a line segment of length 5cm, the opening of the compass should be more than half of 5cm.
- If an angle of measure 90° is bisected twice the angle so obtained measures $22\frac{1}{2}^\circ$.
- In an isosceles ΔPQR , the bisector of $\angle Q$ and $\angle R$ meet at O. If $\angle QOR = 140^\circ$, then $\angle P = \underline{100^\circ}$.

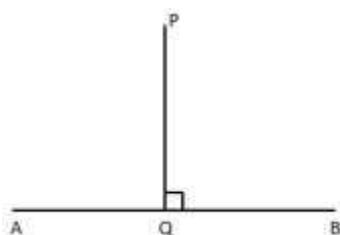
True /False:

- True
- False
- False
- True

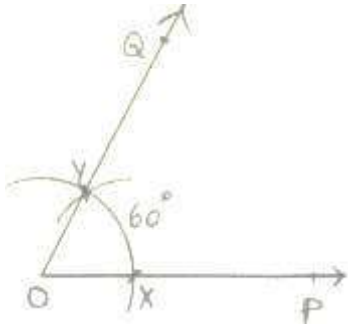
Very Short Answer:

- If an angle of 110° is bisected (divided into two equal parts), then each angle would be $\frac{110^\circ}{2} = 55^\circ$

2.



3.



Steps of Construction:

1. Draw a ray \overrightarrow{OP} .
2. With 'O' as centre and any radius, draw an arc. Cutting \overrightarrow{OP} at x.
3. With x as centre and the same radius, draw another arc intersecting the first arc at y
4. Join O, Y and produce it to Q.
5. Hence, $\angle POQ = 60^\circ$ is the required angle.

4.

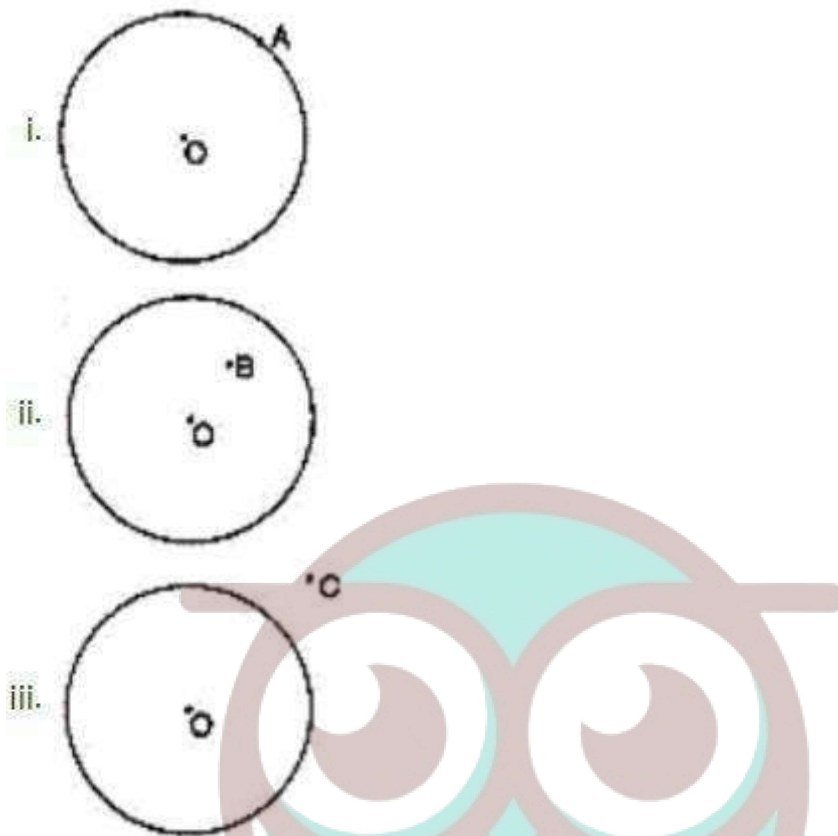


steps:-

1. Place the zero mark of the ruler at 'P'.
2. Mark a point 'Q' at a distance of 6cm from 'P'.
3. Again mark a point 'R' at a distance of 4.5cm from 'P'.
4. Hence by measuring \overrightarrow{QR} we find $\overrightarrow{QR} = 6 - 4.5 = 1.5\text{cm}$.

5.

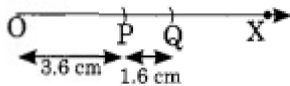




Short Answer:

1. Step I: Draw a ray OX.

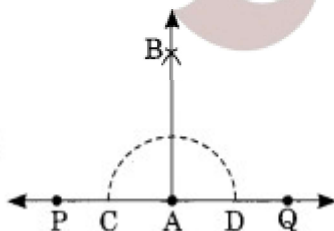
Step II: With centre O and radius equal to the length of AB (3.6 cm) mark a point P on the ray.



Step III: With centre P and radius equal to the length of CD (1.6 cm) mark another point Q on the ray.

Thus OQ is the required segment such that $OQ = 3.6 \text{ cm} + 1.6 \text{ cm} = 5.2 \text{ cm}$.

2. Step I Draw a line \overleftrightarrow{PQ} and take any point A on it.



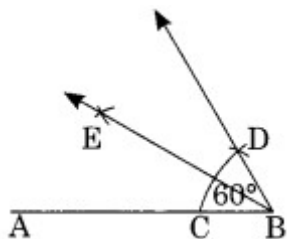
Step II: With centre A draw an arc which meets PQ at C and D.

Step III: Join AB and produce.

Step IV: With centres C and D and radius equal to half of the length of the previous arc, draw two arcs which meet each other at B.

Thus AB is the required perpendicular to \overleftrightarrow{PQ} .

3. Step I: Draw a line segment \overrightarrow{AB} .



Step II: With centre B and proper radius, draw an arc which meets AB at C.

Step III: With C as centre and the same radius as in step II, draw an arc cutting the previous arc at D.

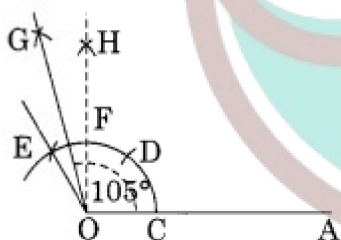
Step IV: Join B to D and produce.

Step V: Draw the bisector BE of $\angle ABD$.

Thus BE is the required bisector of $\angle ABD$.

4.

Step I: Draw a line segment \overrightarrow{OA} .



Step II: With centre O and proper radius, draw an arc which meets OA at C.

Step III: With centre C and radius same, mark D and E on the previous arc.

Step IV: Join O to E and produce.

Step V: $\angle EOA$ is the required angle of 120° .

Step VI: Construct an angle of 90° which meets the previous arc at F.

Step VII: With centre E and F and proper radius, draw two arcs which meet each other at G.

Step VIII: Join OG and produce.

Thus $\angle GOA$ is the required angle of 105° .

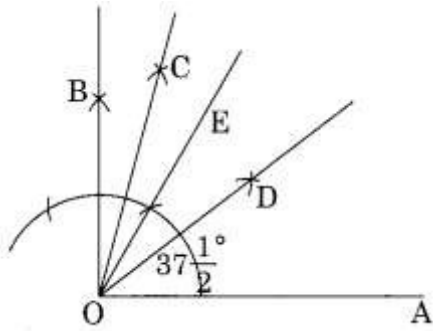
5. Step I: Draw a line segment OA.

Step II: Construct $\angle BOA = 90^\circ$ and $\angle EOA = 60^\circ$

Step III: Draw OC as the bisector of $\angle BOE$, which equal to

$$\frac{60^\circ + 90^\circ}{2} = 75^\circ$$

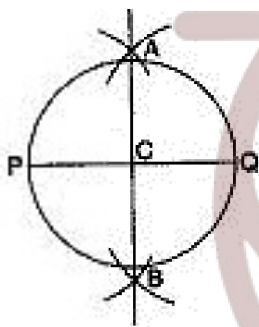
Step IV: Draw the bisector OD of $\angle COA$.



Thus $\angle DOA$ is the required angle of $37\frac{1}{2}^\circ$.

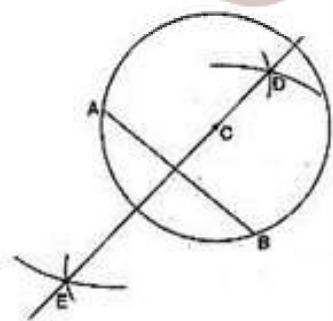
Long Answer:

1.



1. Draw a line segment \overline{PQ} of length 6.1cm.
2. With P as centre, using compasses, draw an arc. The radius of this arc should be more than half of the length of \overline{PQ} .
3. With the same radius and with Q as centre, draw another arc using compasses. Let it cut the previous arcs at A and B.
4. Join \overline{AB} . It cuts \overline{PQ} at C. Then \overline{AB} is the perpendicular bisector of the line segment \overline{PQ} .
5. Place the pointer of the compasses at C and open the pencil up to P.
6. Turn the compasses slowly to draw the circle

2.

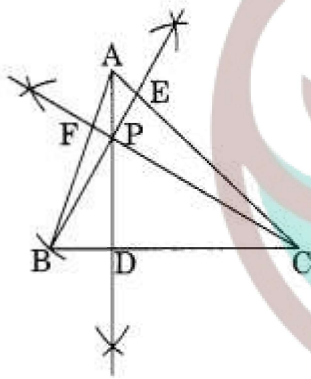


1. Draw a point with a sharp pencil and mark it as C.
2. Open the compasses for the required radius 3.4cm, by putting the pointer on 0 and opening the pencil upto 3.4cm.

3. Place the pointer of the compasses at C.
4. Turn the compasses slowly to draw the circle.
5. Draw any chord \overline{AB} of this circle.
6. With A as centre, using compasses, draw an arc. The radius of this arc should be more than half of the length of \overline{AB} .
7. With the same radius and with B as centre, draw another arc using compasses. Let it cut the previous arcs at D and E.
8. Join \overline{DE} . Then \overline{DE} is the perpendicular bisector of the line segment \overline{AB} . On examining, we find that it passes through C.

3. Step I: Draw any $\triangle ABC$.

Step II: Draw the perpendicular AD from A to BC.



Step III: Draw the perpendicular BE from B to AC.

Step IV: Draw the perpendicular CF from C to AB.

We observe that the perpendiculars AD, BE and CF intersect each other at P.

Thus, P is the point of intersection of the three perpendiculars.

Assertion and Reason Answers:

- 1) a) Both A and R are individually true and R is the correct explanation of A:
- 2) d) A is false but R is true.