GRADE: 7

- SUBJECT: Mathematics
- LESSON: Lines and Angles
- DURATION: 2½ hrs
- MAX MARKS: 80

DETAILED ANSWERS

SECTION A (4 × 10 = 40 marks)

1. Choose the correct option:

a) If two angles are complementary, their sum is:

- **Correct Answer:** (ii) 90°
- **Explanation:** Complementary angles sum up to 90°.

b) If two lines are parallel, then their corresponding angles are:

- **Correct Answer:** (i) Equal
- **Explanation:** When a transversal cuts two parallel lines, corresponding angles are always equal.

c) An angle that measures more than 90° but less than 180° is called:

- **Correct Answer:** (ii) Obtuse Angle

- **Explanation:** An obtuse angle is greater than 90° but less than 180°. d) If one angle of a linear pair is 65°, the other angle will be:

- **Correct Answer:** (i) 115°

- **Explanation:** Linear pairs are supplementary, meaning their sum is 180°.

  - Other angle = 180° - 65° = 115°

2. Solve the following:

a) Find the supplement of 117°.

- **Solution:** Supplementary angles sum up to 180°.
  - Supplement of 117° = 180° - 117° = **63°**

b) Find the complement of 53°.

- **Solution:** Complementary angles sum up to 90°.
  - Complement of 53° = 90° - 53° = **37°**

c) Two complementary angles are in the ratio 2:3. Find both angles.

- **Solution:** Let the angles be **2x** and **3x**.
  - 2x + 3x = 90°
  - 5x = 90°
  - x = 18°
  - Angles: **2x = 36°, 3x = 54°**

3. Find the value of x:

a) If two vertically opposite angles are given as (4x + 10)° and (2x + 50)°, find x.

- **Solution:**
  - 4x + 10 = 2x + 50 (Vertically opposite angles are equal)
  - 4x - 2x = 50 - 10
  - 2x = 40
  - x = **20**

b) Two supplementary angles are in the ratio 7:2. Find both angles.

- **Solution:** Let the angles be **7x** and **2x**.
  - 7x + 2x = 180°
  - 9x = 180°
  - x = 20°
  - Angles: **7x = 140°, 2x = 40°**

4. State TRUE or FALSE:

a) Two obtuse angles can be supplementary. **FALSE** (Their sum would exceed 180°)

b) Adjacent angles always form a linear pair. **FALSE** (Only if their sum is 180°)

c) If two angles form a linear pair, they are always supplementary. **TRUE**

d) Two right angles can be complementary. **FALSE** (Their sum is 180°, not 90°)

5. Solve the following problems:

a) A transversal intersects two parallel lines. One of the angles formed is 75°. Find corresponding, alternate, and co-interior angles.

- **Solution:**
    - Corresponding angle = 75°
    - Alternate interior angle = 75°
    - Co-interior angle = 180° - 75° = **105°**

b) Given ∠**AOB = 40°** and ∠**BOC = 2x + 20°**, find x if **AOB and BOC form a linear pair**.

- **Solution:**
    - ∠AOB + ∠BOC = 180°
    - 40 + (2x + 20) = 180
    - 2x + 60 = 180
    - 2x = 120
    - x = **60**

SECTION B (4 × 10 = 40 marks)

6. Graph-Based Question:

a) **Bar Graph Representation** (Graph drawn separately)

b) **Students who scored more than 30 marks:**

- 40 marks: 8 students
- 50 marks: 12 students
- **Total: 8 + 12 = 20 students**

7. Solving for Angles:

a) If one alternate interior angle is 65°, other angles:

- Alternate interior: **65°**
- Corresponding: **65°**
- Co-interior: **115°**

b) Two angles in ratio 5:4 forming a linear pair:

- 5x + 4x = 180°
- 9x = 180°
- x = 20°
- Angles: **100°, 80°**

8. Solving Equations:

a) **5(x - 2) + 3 = 4x + 7**

- 5x - 10 + 3 = 4x + 7
- 5x - 7 = 4x + 7
- x = 14

b) **Angles of a quadrilateral (3:4:5:6)**

- 3x + 4x + 5x + 6x = 360°
- 18x = 360°
- x = 20°
- Angles: **60°, 80°, 100°, 120°**

9. Application-Based Question:

a) **Ladder Angle**: 180° - 65° = **115°**

b) **Car Travel:** Distance = Speed × Time

- 60 km/h × (20/60) h = **20 km**

10. HOTS:

a) **Three consecutive angles on a straight line**

- x + (x + 10) + (x + 20) = 180°
- 3x + 30 = 180
- x = 50

b) **Vertically opposite angles**

- 5x + 10 = 3x + 50
- 2x = 40
- x = 20
- Angles: **110°**

END OF SOLUTIONS