**Practice Questions On Supplementary Angles**

**Name: _____ Date: _____**

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# Supplementary Angles Worksheet Questions

### Fill in the Blanks

1. The supplement of 55° is ___°. **Answer: 125°**
2. Two supplementary angles in ratio 1:2 are ___° and ___°. **Answer: 60° and 120°**
3. If both supplementary angles are equal, each measures ___°. **Answer: 90°**
4. A linear pair always adds up to ___°. **Answer: 180°**
5. The supplement of the supplement of 70° is ___°. **Answer: 70°**

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### True or False

1. Supplementary angles must be adjacent. **False** they only need to sum to 180°.
2. Two obtuse angles can be supplementary. **False** their sum would exceed 180°.
3. A right angle is supplementary to another right angle. **True** 90 + 90 = 180.
4. Complementary angles and supplementary angles can both equal 90° each. **False** complementary angles sum to 90°, not 180°.
5. Co-interior angles between parallel lines are supplementary. **True**.

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### Match the Following

| Angle | Its Supplement |
|---|---|
| 30° | 150° |
| 90° | 90° |
| 140° | 40° |
| 175° | 5° |

| | |
|---|---|
| 65° | 115° |

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**Short Answer Questions**

**Q1: Can an obtuse angle have a supplement? If yes, what type is the supplement? A:** Yes. If the angle is obtuse (between 90° and 180°), its supplement = 180° − obtuse angle, which gives an acute angle (between 0° and 90°).

**Q2: Is 0° a valid supplementary angle? A:** Theoretically, 0° + 180° = 180°, so yes — 0° and 180° form a supplementary pair, though this is a degenerate case in practical geometry.

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**HOTS Questions on Supplementary Angles**

**Higher-Order Thinking Questions**

**Q1: Angle A is supplementary to Angle B. Angle B is supplementary to Angle C. Angle C = 50°. Find Angle A without finding Angle B.**

**Solution:** Since B and C are supplementary: B + 50 = 180 → B = 130°. Since A and B are supplementary: A + 130 = 180 → A = **50°**.

Shortcut insight: A = C. Supplements of the same angle are always equal.

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**Q2: Two supplementary angles differ by 40°. Find both.**

**Solution:** Let angles = x and x + 40.

x + (x + 40) = 180 2x = 140 x = 70

Angles = **70° and 110°**.

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**Exam-Oriented Problems**

**Q3: In a quadrilateral ABCD, angles A and B are supplementary, and angles C and D are supplementary. If angle A = 95° and angle C = 88°, find all four angles.**

**Solution:** B = 180 − 95 = **85°** D = 180 − 88 = **92°**

Check: A+B+C+D = 95+85+88+92 = **360°** (sum of interior angles of a quadrilateral is 360°).

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**Mixed Geometry Questions**

**Q4: Angles on a straight line are in ratio 1:2:3. Find all three angles.**

**Solution:** k + 2k + 3k = 180 6k = 180 k = 30

Angles = **30°, 60°, 90°**.

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**Q5: A ray divides a straight angle into two parts. One part is 25° less than three times the other. Find both parts.**

**Solution:** Let one part = x. Other = 3x − 25.

x + (3x − 25) = 180 4x = 205 x = 51.25°

Other angle = 3(51.25) − 25 = 153.75 − 25 = **128.75°**

Both together = 51.25 + 128.75 = 180°

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**Practice Test on Supplementary Angles**

**Beginner Level**

1. Find the supplement of 35°. **Answer: 145°**
2. Are 95° and 85° supplementary? **Answer: Yes, 95+85=180**
3. Two equal supplementary angles. Find each. **Answer: 90°**
4. Supplement of 150°? **Answer: 30°**
5. One angle = 2x, its supplement = 3x. Find x. **Answer: 36°**

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**Intermediate Level**

1. Angles are (5x+3)° and (3x+1)°. Find both if supplementary. **Answer:** 8x+4=180 → x=22. Angles: 113° and 67°.

2. Supplement is 5 times the angle. Find the angle. **Answer:** x + 5x = 180 → x = 30°. Supplement = 150°.

3. Two supplementary angles are in ratio 7:11. Find both. **Answer:** 7k+11k=180 → k=10. Angles: 70° and 110°.

4. A straight line is divided into three angles: x°, 2x°, 3x°. Find x. **Answer:** 6x=180 → x=30°.

5. Supplement of (90° − x) = ? **Answer:** 180 − (90−x) = 90 + x.

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**Advanced Level**

1. Prove that if two lines intersect, opposite angles are equal using supplementary angle reasoning. **Answer:** Angles a and b are supplementary (linear pair): a+b=180. Angles b and c are supplementary: b+c=180. Therefore a=c (vertically opposite angles are equal).

2. Two supplementary angles are such that the larger exceeds twice the smaller by 18°. Find both. **Answer:** Let smaller = x. Larger = 180−x. 180−x = 2x+18 → 162=3x → x=54°. Angles: 54° and 126°.

3. In a triangle, one exterior angle is 140°. Find the two non-adjacent interior angles if they are supplementary to each other. **Answer:** Two interior angles sum to 180°... wait  interior angles of a triangle sum to 180° in total, not any specific pair. An exterior angle = 140° means the two non-adjacent interior angles sum to 140° (exterior angle theorem). So these two angles are NOT supplementary (140° ≠ 180°). Recognising this is the HOTS insight not all angle pairs in a triangle are supplementary.

4. A line intersects two parallel lines. If one co-interior angle is (4x+10)° and the other is (2x+20)°, find x and both angles. **Answer:** Co-interior angles are

supplementary: (4x+10)+(2x+20)=180 → 6x+30=180 →
x=25. Angles: 110° and 70°.

5. The supplement of an angle exceeds its complement by 90°. Find the angle.
   **Answer:** Supplement = 180−x. Complement = 90−x. (180−x) − (90−x) = 90. 90 = 90. This is true for every angle; the difference between supplement and complement is always 90°, regardless of the angle.