

GRADE 6 MATHEMATICS

GEOMETRY: ANGLES & LINES

Complete printable worksheet pack

Angle types • angle relationships • parallel lines • transversals • missing angles • geometric reasoning

Worksheet 1: Angle Types & Measurement

Show your working. Give angle answers in degrees ($^{\circ}$).

1. Name the type of each angle: 35° , 90° , 125° , 180° , 270° .
2. Classify these angles as acute, right, obtuse, straight or reflex: 48° , 89° , 102° , 179° , 225° .
3. Find the complement of 37° .
4. Find the supplement of 116° .
5. An angle measures 72° . What is the angle vertically opposite to it?
6. Two angles form a straight line. One is 64° . Find the other.
7. Three angles around a point are 85° , 120° and x° . Find x .
8. Challenge: Four angles around a point are $2x^{\circ}$, $3x^{\circ}$, $4x^{\circ}$ and x° . Find x and all four angles.

Answer Key — 1: Angle Types & Measurement

1. Acute; right; obtuse; straight; reflex.
2. Acute; acute; obtuse; obtuse; reflex.
3. 53° .
4. 64° .
5. 72° .
6. 116° .
7. 155° .
8. $x=36^\circ$; angles $72^\circ, 108^\circ, 144^\circ, 36^\circ$.

Teacher note: Accept equivalent correct methods and clearly shown reasoning.

Worksheet 2: Angle Relationships

Show your working. Give angle answers in degrees ($^{\circ}$).

1. Two angles are complementary. One is 28° . Find the other.
2. Two angles are supplementary. One is 143° . Find the other.
3. Vertically opposite angles are $5x^{\circ}$ and 85° . Find x .
4. Adjacent angles on a straight line are $(3x + 10)^{\circ}$ and $(2x + 20)^{\circ}$. Find x and both angles.
5. Angles around a point are $2x^{\circ}$, $3x^{\circ}$, $4x^{\circ}$ and 90° . Find x .
6. An angle is 18° greater than its complement. Find both angles.
7. An angle is 24° less than its supplement. Find both angles.
8. Challenge: Three angles on a straight line are x° , $(2x + 15)^{\circ}$ and $(3x - 25)^{\circ}$. Find x and each angle.

Answer Key — 2: Angle Relationships

1. 62° .
2. 37° .
3. $x=17$.
4. $x=30$; angles 100° and 80° .
5. $x=30$; angles $60^\circ, 90^\circ, 120^\circ, 90^\circ$.
6. 36° and 54° .
7. 78° and 102° .
8. $x=25$; angles $25^\circ, 65^\circ, 50^\circ$.

Teacher note: Accept equivalent correct methods and clearly shown reasoning.

Worksheet 3: Parallel Lines & Transversals

Show your working. Give angle answers in degrees ($^{\circ}$).

1. Two parallel lines are crossed by a transversal. One corresponding angle is 68° . What is the matching corresponding angle?
2. If one angle formed by parallel lines and a transversal is 112° , what is the adjacent angle on a straight line?
3. Alternate interior angles are $(3x + 10)^{\circ}$ and 100° . Find x .
4. Co-interior angles are $(2x + 15)^{\circ}$ and $(3x + 10)^{\circ}$. Find x .
5. An acute angle formed by a transversal is 57° . What is the corresponding obtuse angle?
6. Two parallel lines have a transversal. One interior angle is 74° . Find the co-interior angle on the same side.
7. Explain why corresponding angles are equal when a transversal crosses parallel lines.
8. Challenge: A pair of alternate interior angles are $(4x - 8)^{\circ}$ and $(2x + 52)^{\circ}$. Find x and the angle.

Answer Key — 3: Parallel Lines & Transversals

1. 68° .
2. 68° .
3. $x=30$.
4. $x=31$.
5. 123° .
6. 106° .
7. Because corresponding angles are equal for parallel lines cut by a transversal.
8. $x=30$; angle 112° .

Teacher note: Accept equivalent correct methods and clearly shown reasoning.

Worksheet 4: Missing Angles in Shapes

Show your working. Give angle answers in degrees ($^{\circ}$).

1. A triangle has angles 48° and 67° . Find the third angle.
2. A triangle has angles $(2x)^{\circ}$, $(3x + 10)^{\circ}$ and $(x + 20)^{\circ}$. Find x and all angles.
3. An isosceles triangle has two equal angles of 52° . Find the third angle.
4. A quadrilateral has angles 85° , 110° , 95° and x° . Find x .
5. A parallelogram has one angle of 68° . Find all four angles.
6. A rectangle has four equal angles. What is each angle?
7. A regular pentagon has five equal interior angles. Find each interior angle using the sum of interior angles formula.
8. Challenge: A quadrilateral has angles $(2x + 10)^{\circ}$, $(3x - 5)^{\circ}$, 90° and $(x + 15)^{\circ}$. Find x and all angles.

Answer Key — 4: Missing Angles in Shapes

1. 65° .
2. $x=25$; angles $50^\circ, 85^\circ, 65^\circ$.
3. 76° .
4. 70° .
5. $68^\circ, 112^\circ, 68^\circ, 112^\circ$.
6. 90° each.
7. 108° .
8. $x=40$; angles $90^\circ, 115^\circ, 90^\circ, 65^\circ$.

Teacher note: Accept equivalent correct methods and clearly shown reasoning.

Worksheet 5: Angles in Real-Life Geometry

Show your working. Give angle answers in degrees ($^{\circ}$).

1. A ladder makes an angle of 68° with the ground. What angle does it make with a vertical wall, assuming the wall and ground are perpendicular?
2. Two roads cross. One angle is 73° . Find the vertically opposite angle and the two adjacent angles.
3. A roof has a triangular cross-section with two equal base angles of 42° . Find the top angle.
4. A rectangular picture frame has one corner marked 90° . What can you say about its other three corners?
5. A regular hexagon has equal interior angles. Find each interior angle.
6. A clock's hands form an angle of 120° . Classify the angle.
7. A ramp makes an angle of 15° with the ground. How much larger is the complementary angle?
8. Challenge: A regular polygon has each interior angle equal to 135° . Find the number of sides using the exterior-angle method.

Answer Key — 5: Angles in Real-Life Geometry

1. 22° .
2. 73° , 73° , 107° , 107° .
3. 96° .
4. All four are 90° .
5. 120° .
6. Obtuse.
7. 75° .
8. 8 sides.

Teacher note: Accept equivalent correct methods and clearly shown reasoning.

Worksheet 6: Angles & Lines Reasoning Challenge

Show your working. Give angle answers in degrees ($^{\circ}$).

1. Two intersecting lines form angles $(3x + 10)^{\circ}$ and $(5x - 30)^{\circ}$ as a pair of vertically opposite angles. Find x and the angle.
2. A triangle has exterior angle 125° . One remote interior angle is 48° . Find the other remote interior angle.
3. Two parallel lines are crossed by a transversal. A pair of alternate interior angles are $(5x - 15)^{\circ}$ and $(3x + 25)^{\circ}$. Find x and the angle.
4. A quadrilateral has three angles 72° , 108° and 124° . Find the fourth angle.
5. The angles of a triangle are in the ratio 2:3:4. Find all three angles.
6. A regular polygon has an exterior angle of 30° . How many sides does it have?
7. An isosceles triangle has a vertex angle of 46° . Find each base angle.
8. Challenge: A quadrilateral has angles in the ratio 2:3:4:6. Find all four angles and identify whether it can be a parallelogram.

Answer Key — 6: Angles & Lines Reasoning Challenge

1. $x=20$; angle 70° .
2. 77° .
3. $x=20$; angle 85° .
4. 56° .
5. $40^\circ, 60^\circ, 80^\circ$.
6. 12 sides.
7. 67° each.
8. Angles $48^\circ, 72^\circ, 96^\circ, 144^\circ$; no, a parallelogram needs opposite angles equal.

Teacher note: Accept equivalent correct methods and clearly shown reasoning.