UNIT 4

STUDENT BOOK 1 LESSON

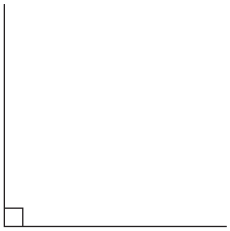
Naming Angles

Quick Review

At Home At School

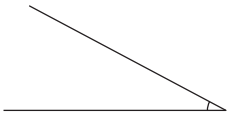
An angle is formed when 2 lines meet.

right angle

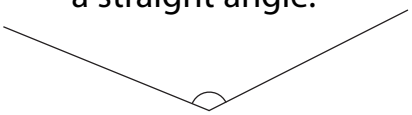


straight angle

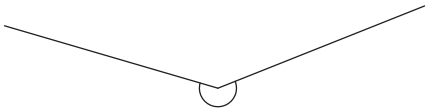
An **acute angle** is less than a right angle.



An **obtuse angle** is greater than a right angle, but less than a straight angle.



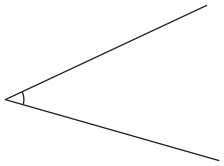
A **reflex angle** is greater than a straight angle.



Try These

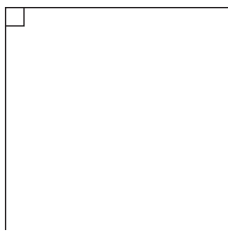
1. Name each angle as a right, acute, obtuse, straight, or reflex angle.

a)



_____

b)

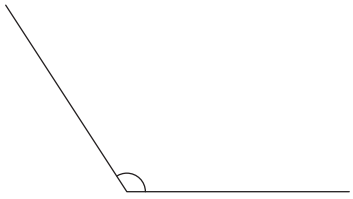


_____

c)

_____

d)



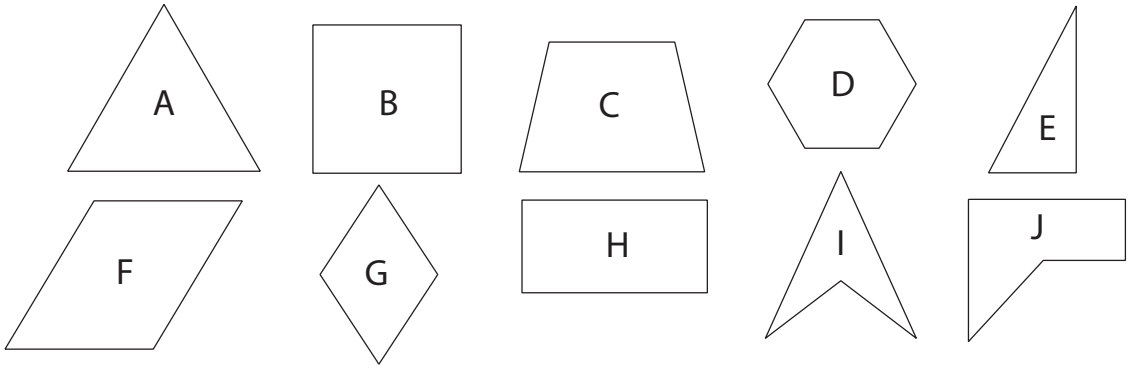
_____

Practice

1. List the shapes with:

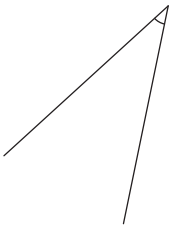
a) a right angle _____ **b)** an obtuse angle _____

c) an acute angle _____ **d)** a reflex angle _____



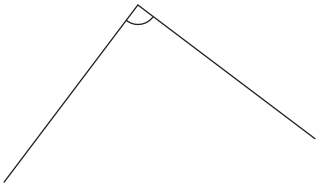
2. Name each angle.

a)



_____

b)

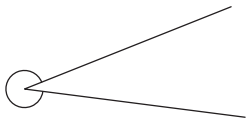


_____

c)

_____

d)



_____

Stretch Your Thinking

Think about the angles formed by the hour hand and the minute hand on a clock. Write a time when the angle is:

a) an acute angle _____ **b)** an obtuse angle _____

c) a right angle _____ **d)** a reflex angle _____

UNIT 4

STUDENT BOOK 2 LESSON

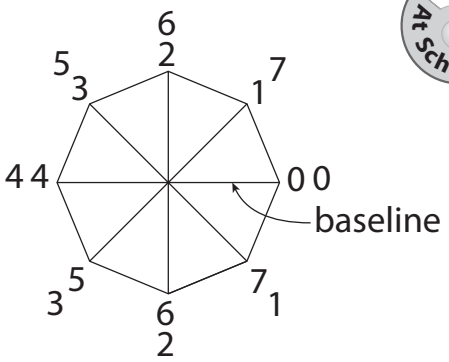
Exploring Angles

At Home At School

Quick Review

➤ A **protractor** measures angles.

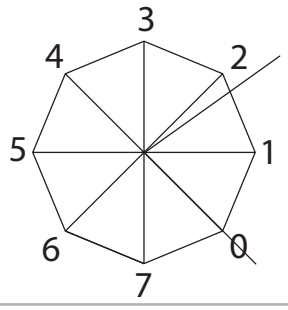
The protractor you made looks like this:



It is divided into 8 equal units. The units are labelled from 0 to 7 clockwise and counterclockwise.

To measure an angle, count how many units fit the angle.

This angle is about 2 units.

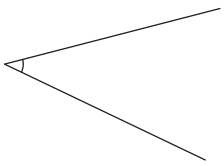


Try These

Use an 8-unit protractor.

1. Use your protractor to measure each angle.

a)



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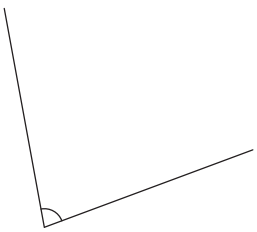
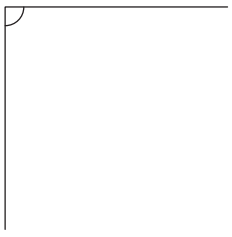
b)



_____

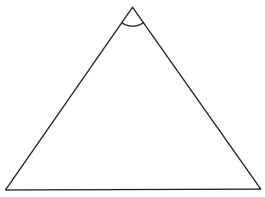
c)



_____

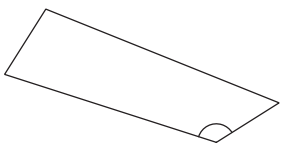
2. Use your protractor to measure the marked angle in each polygon below.

a)



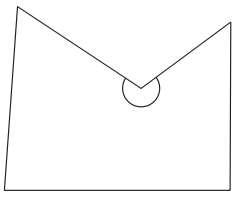
_____

b)



_____

c)



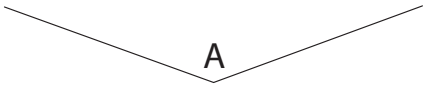
_____

Practice

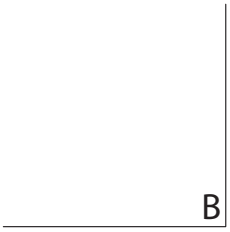
Use an 8-unit protractor.

1. Measure each angle. Record the measurements in the chart.

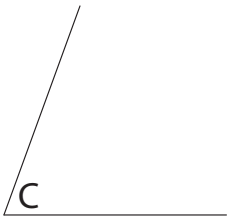
a)



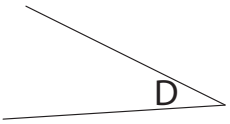
b)



c)



d)



Angle	Measure
A	
B	
C	
D	

2. Use the angle measures from question 1. Write <, >, or =.

a) D _____ A **b)** B _____ C **c)** A _____ C

3. Use a ruler. Estimate to draw each angle.

a) a $2\frac{1}{2}$-unit angle **b)** a 7-unit angle **c)** a 4-unit angle

4. Measure each angle you drew in question 3. Record the measures.

a) _____ **b)** _____ **c)** _____

Stretch Your Thinking

Explain how you can use your 8-unit protractor to measure a reflex angle.

UNIT 4

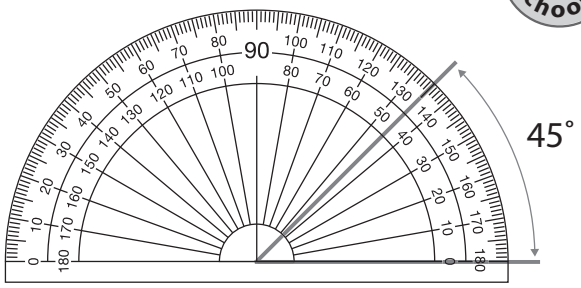
STUDENT BOOK 3 LESSON

Measuring Angles

At Home At School

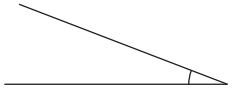
Quick Review

➤ A **standard protractor** shows angle measures from 0° to 180°, both clockwise and counterclockwise. The measure of this angle is 45°.



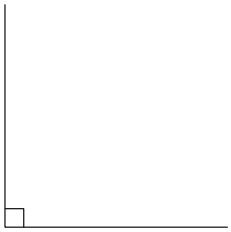
➤ Angles are named according to their measures in degrees.

Acute Angle



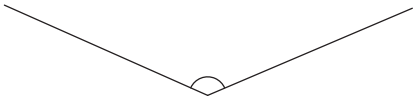
less than 90°

Right Angle



90°

Obtuse Angle



between 90° and 180°

Straight Angle

180°

Reflex Angle

between 180° and 360°

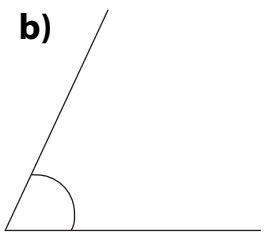
Try These

1. Use a protractor to measure each angle. Record the measurements.

a)

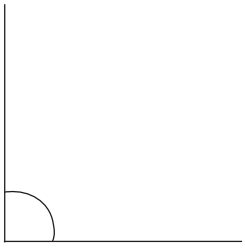
_____

b)



_____

c)

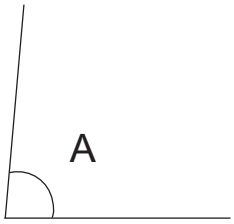


_____

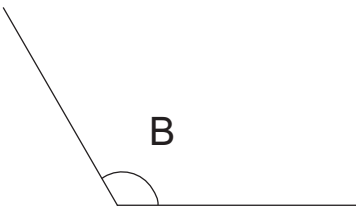
Practice

1. Measure each angle. Record the measurements in the chart.

a)

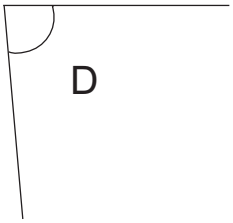


b)



c)

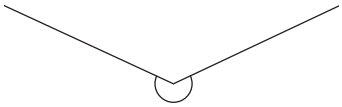
d)



Angle	Measure
A	
B	
C	
D	

2. Estimate the size of each angle.
Measure and record each angle size.

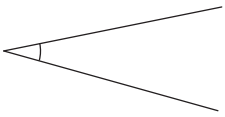
a)



Estimate: _____

Measure: _____

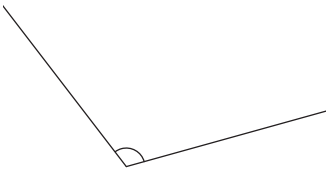
b)



Estimate: _____

Measure: _____

c)



Estimate: _____

Measure: _____

3. Name each angle in question 2 as acute, right, obtuse, or reflex.

a) _____ **b)** _____ **c)** _____

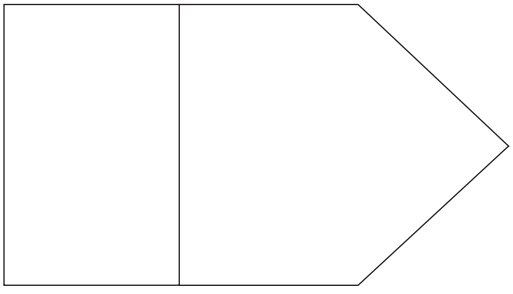
Stretch Your Thinking

How many of each kind of angle can you find in this picture?
Mark each kind in a different colour.

a) right angle _____

b) obtuse angle _____

c) acute angle _____



UNIT 4

STUDENT BOOK 4 LESSON

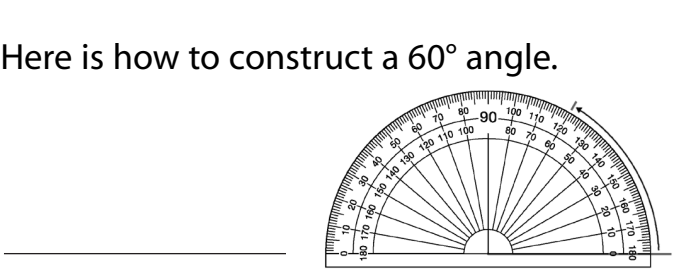
Drawing Angles

Quick Review

At Home At School

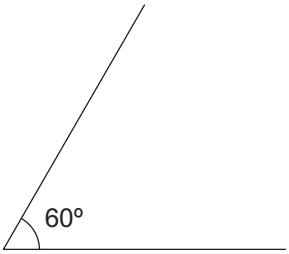
➤ We use a ruler and a protractor to construct an angle with a given measure.

Here is how to construct a 60° angle.



Draw one arm of the angle.

Place the centre of the protractor at one end of the arm so that the base line of the protractor lies along the arm. Find 60° and make a mark.



Remove the protractor.
Draw the arm.
Label the angle.

Try These

1. Use a ruler and protractor.
Draw an obtuse angle with each measure.

a) 135° **b)** 100° **c)** 167°

2. Use only a ruler. Estimate to draw each angle.

a) 75° **b)** 145° **c)** 50°

Practice

1. Use a ruler and protractor.
Draw an acute angle with each measure.

a) 55° **b)** 20° **c)** 38°

2. Use only a ruler. Estimate to draw each angle.

a) 90° **b)** 80° **c)** 150°

Stretch Your Thinking

Without using a protractor,
draw an angle that is close to 45°.
Explain how you did it.

UNIT 4

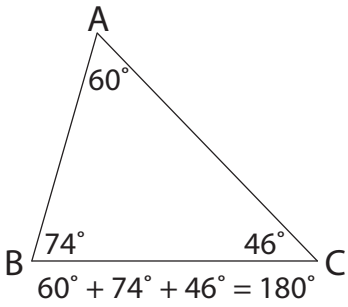
STUDENT BOOK 6 LESSON

Investigating Angles in a Triangle

Quick Review

At Home At School

➤ The sum of the **interior angles** in a triangle is 180°.



$60^\circ + 74^\circ + 46^\circ = 180^\circ$

➤ To find the measure of $\angle C$ in triangle ABC:

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

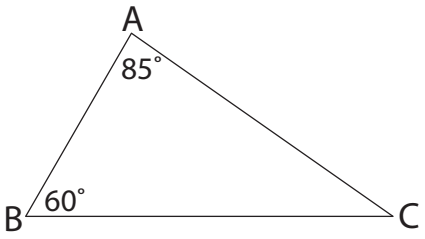
Since $\angle A = 85^\circ$ and $\angle B = 60^\circ$,

$85^\circ + 60^\circ + \angle C = 180^\circ$

$145^\circ + \angle C = 180^\circ$

$180^\circ - 145^\circ = 35^\circ$

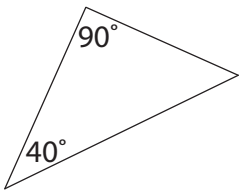
So, the measure of $\angle C$ is 35°.



Try These

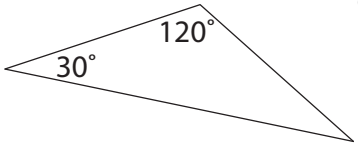
1. Determine the measure of the third angle without measuring.

a)



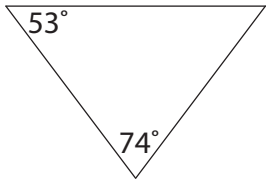
_____

b)



_____

c)



_____

2. Two angles of a triangle are given.
Find the measure of the third angle.
Show your work.

a) 70°, 60° ____ _____

b) 25°, 90° ____ _____

c) 110°, 40° ____ _____

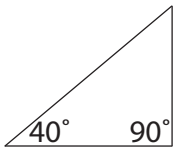
Practice

1. Determine if a triangle can be drawn with the angle measures given.
If a triangle can be drawn, draw and label it.

a) 35°, 65°, 80° **b)** 55°, 50°, 50° **c)** 45°, 45°, 90° **d)** 95°, 45°, 50°

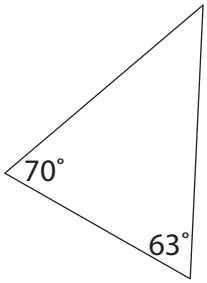
2. Determine the measure of the third angle without measuring.

a)



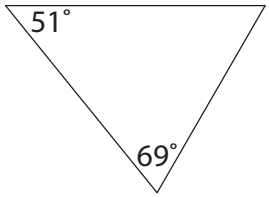
_____

b)



_____

c)



_____

3. Two angles of a triangle are given.
Find the measure of the third angle.

a) 62°, 85° _____ **b)** 60°, 25° _____ **c)** 37°, 90° _____

Stretch Your Thinking

Can you construct triangle DEF? Explain.

$\angle D = 109°$
$\angle E = 60°$
$\angle F = 12°$

_____

_____

UNIT 4

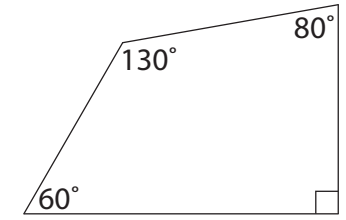
STUDENT BOOK 7 LESSON

Investigating Angles in a Quadrilateral

At Home At School

Quick Review

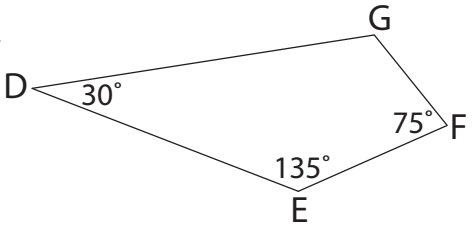
➤ The sum of the interior angles in a quadrilateral is 360°.



$130^\circ + 80^\circ + 90^\circ + 60^\circ = 360^\circ$

➤ To find the measure of ∠G in quadrilateral DEFG:

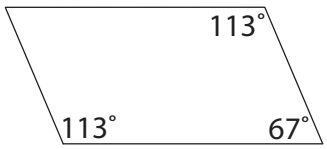
∠D + ∠E + ∠F + ∠G = 360°
Since ∠D = 30°, ∠E = 135°, and ∠F = 75°,
30° + 135° + 75° + ∠G = 360°
240° + ∠G = 360°
360° – 240° = 120°
So, the measure of ∠G is 120°.



Try These

1. Determine the measure of the fourth angle without measuring.

a)



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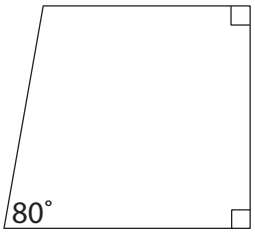
b)



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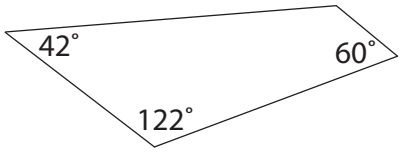
c)



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2. Three angles of a quadrilateral are given.
Find the measure of the fourth angle.

a) 25°, 70°, 110° _____ **b)** 42°, 38°, 100° _____

c) 90°, 90°, 41° _____ **d)** 115°, 95°, 63° _____

e) 107°, 36°, 49° _____ **f)** 116°, 72°, 49° _____

Practice

1. Determine if a quadrilateral can be drawn with the angle measures given. If a quadrilateral can be drawn, draw and label it.

a) 90°, 75°, 60°, 135° **b)** 50°, 45°, 70°, 120° **c)** 125°, 70°, 85°, 80°

2. Find the measure of the fourth angle in each quadrilateral.

Quadrilateral	∠J	∠K	∠L	∠M
A	149°	80°	26°	
B	120°	75°	97°	
C	76°	75°	84°	
D	150°	100°	70°	
E	37°	83°	151°	

Stretch Your Thinking

Is it possible to make a quadrilateral with 3 obtuse angles and 1 right angle? Explain.