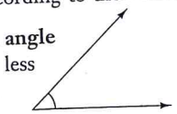
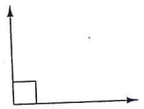
3.3 Classifying Angles

We name angles according to their sizes.

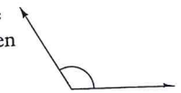
An **acute angle** measures less than 90°.



A **right angle** measures 90°.

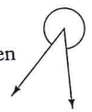


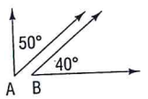
An **obtuse angle** measures between 90° and 180°.



A **straight angle** measures 180°.

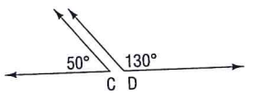
A **reflex angle** measures between 180° and 360°.





Two angles whose sum is 90° are called **complementary angles.**

∠A and ∠B are complementary angles.

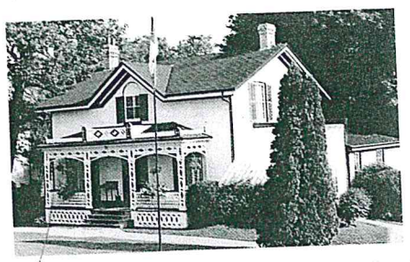


Two angles whose sum is 180° are called **supplementary angles.**

∠C and ∠D are supplementary angles.

Activity: Use the Definitions

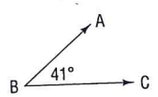
Look at the picture. It shows Alexander Graham Bell's home in Brantford, Ontario.



Example

∠ABC = 41°.

Find the measure of the angle that is



a) complementary to ∠ABC.

b) supplementary to ∠ABC.

Inquire

1. List the types of angles you see in the picture.

2. If you see any angles that are complementary, describe where they are.

3. If you see any angles that are supplementary, describe where they are.

4. Is it possible for two angles to be supplementary if one of them is a straight angle? Explain.

5. If two equal angles are complementary, what is the measure of each angle? Explain.

Solution

a) 90° − 41° = 49°

The complementary angle measures 49°.

b) 180° − 41° = 139°

The supplementary angle measures 139°.

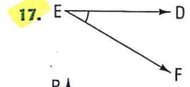
Practice

Classify each angle as acute, right, obtuse, straight, or reflex.

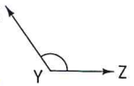
1. 53°	**2.** 7°	**3.** 90°	**4.** 425°
5. 180°	**6.** 79°	**7.** 167°	**8.** 37°
9. 13°	**10.** 299°	**11.** 115°	**12.** 151°
13. 72°	**14.** 190°	**15.** 315°	**16.** 179°

Classify each angle as acute, right, obtuse, straight, or reflex.

17.



18.



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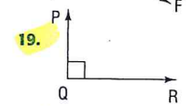

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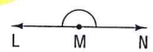

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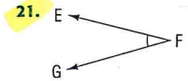

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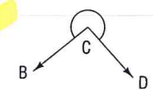


Problems and Applications

For each of the following angles, draw the complementary angle and state its measure.

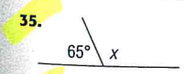
23. 60°	**24.** 45°	**25.** 84°
26. 72°	**27.** 54°	**28.** 17°

For each of the following angles, draw the supplementary angle and state its measure.

29. 50°	**30.** 130°	**31.** 35°
32. 144°	**33.** 68°	**34.** 104°

Determine the missing measures.

35.



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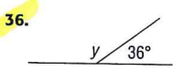

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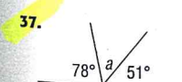

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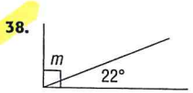


39. Draw a 75° angle.

a) Draw the complementary angle and state its measure.

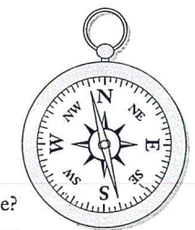
b) Draw the supplementary angle and state its measure.

c) Is the supplement of an acute angle always greater than its complement? Explain.

d) What type of angle is the supplement of an acute angle?

e) What type of angle is the complement of an acute angle?

Examine the picture of the compass, then answer questions 40–43.



40. If you turn 90° clockwise from north, which way will you face?

41. If you face northwest and turn 180°, which way will you face?

42. If you turn 135° counterclockwise from south, which way will you face?

43. You decide to turn 225° clockwise from north. A friend says that you could face the same way by turning a smaller angle from north. What is the smaller angle and which way do you turn? Which way will you face afterwards?

NUMBER POWER

A group of students each bought the same item at a variety store. The total cost before taxes was $56.29. How many students were in the group?