Unit 7, Lesson 4

Solving for Unknown Angles

Let's figure out some missing angles.

4.1 Math Talk: Length Relationships

Here are some line segments.



Decide mentally whether each statement is true.

- $CD + BC = BD$
- $AB + BD = CD + AD$
- $AC - AB = AB$
- $BD - CD = AC - AB<$

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4.2 Info Gap: Angle Finding

Your teacher will give you either a problem card or a data card. Do not show or read your card to your partner.

If If your teacher gives you the problem card:

1. Silently read your card and think about what information you need to answer the question.
2. Ask your partner for the specific information that you need. "Can you tell me _____?"
3. Explain to your partner how you are using the information to solve the problem. "I need to know _____ because . . . ."

   Continue to ask questions until you have enough information to solve the problem.
4. Once you have enough information, share the problem card with your partner, and solve the problem independently.
5. Read the data card, and discuss your reasoning.

If your teacher gives you the data card:

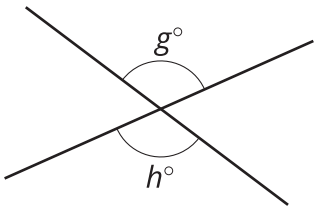
1. Silently read your card. Wait for your partner to ask for information.
2. Before telling your partner any information, ask, "Why do you need to know _____?"
3. Listen to your partner's reasoning and ask clarifying questions. Give only information that is on your card. Do not figure out anything for your partner!

   These steps may be repeated.
4. Once your partner says there is enough information to solve the problem, read the problem card, and solve the problem independently.
5. Share the data card, and discuss your reasoning.

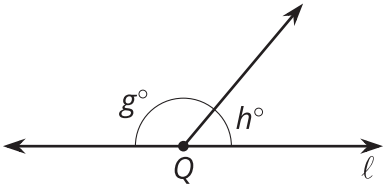
4.3 What's the Match?

Match each figure to an equation that represents what is seen in the figure. For each match, explain how you know they are a match.

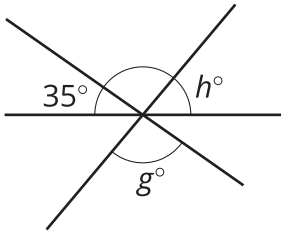
A



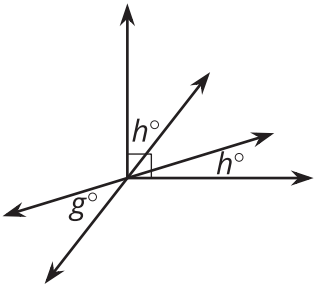
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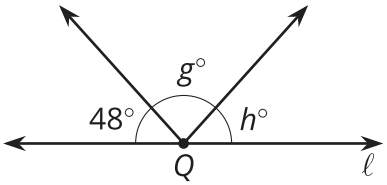
C



D



E



1. $g + h = 180$

2. $g = h$

3. $2h + g = 90$

4. $g + h + 48 = 180$

5. $g + h + 35 = 180$

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Are you ready for more?

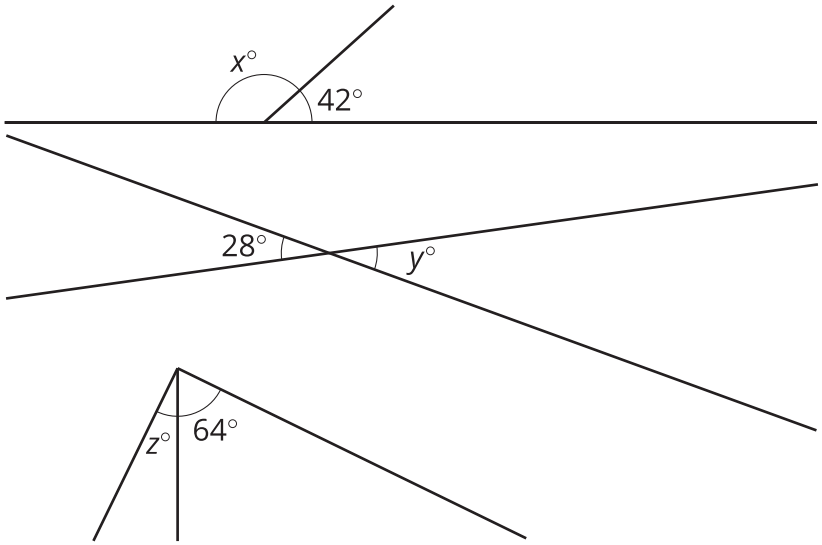
1. What is the angle between the hour and minute hands of a clock at 3:00?

2. You might think that the angle between the hour and minute hands at 2:20 is 60 degrees, but it is not! The hour hand has moved beyond the 2. Calculate the angle between the clock hands at 2:20.

3. Find a time where the hour and minute hand are 40 degrees apart. (Assume that the time has a whole number of minutes.) Is there just one answer?

Lesson 4 Summary

We can write equations that represent relationships between angles.



- The first pair of angles are supplementary, so $x + 42 = 180$.
- The second pair of angles are vertical angles, so $y = 28$.
- Assuming the third pair of angles form a right angle, they are complementary, so $z + 64 = 90$.