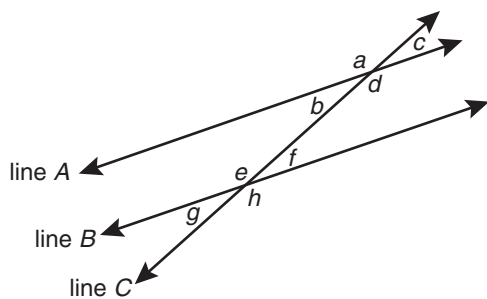## Unit 4: Geometry Lesson 4.1

Game On!

④   1.   Use the diagram to answer the following questions.

a.   Describe the relationship between the following pairs of angles.

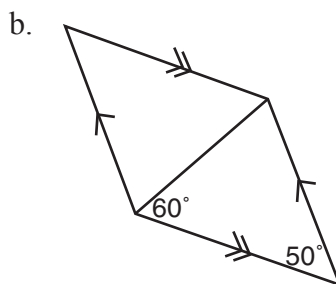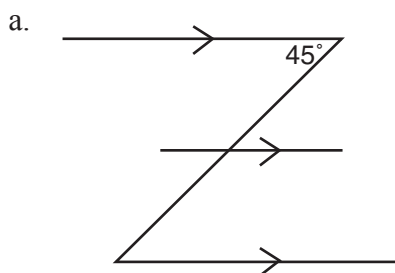   i. *c, g*

   _____

   _____

   ii. *d, h*

   _____

   _____

   iii. *b, c*

   _____

   _____

   iv. *d, e*

   _____

   _____

b. Describe two conditions that would ensure line A and line B are parallel.
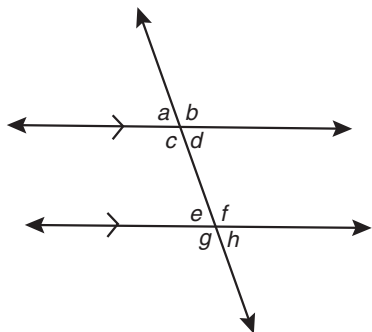
_____

_____

_____

(4) 2. Determine the unknown angles in each diagram. (Hint: extending the lines in b. may help you determine the unknown angles.)

a.

b.

(4) 3. Interior angles on the same side of a transversal are called co-interior angles. In the diagram, c and e are co-interior angles and d and f are co-interior angles.

a. What is the sum of co-interior angles c and e?

_____

b. Prove that co-interior angles will always sum to this amount.

⑥

4. Daphné is designing a poster for her band, the "Sweet Monsters". She wants the letters to be slanted and wants the two words on separate lines. She plans to draw a grid of parallel lines to use as a guide to do this.

a. Using a straightedge and compass or a straightedge and protractor, draw parallel lines that Daphné could use to guide each letter in her poster. Draw your guide so there are **no** right angles.

- Instructions for drawing parallel lines using a compass and straightedge can be found on pp. 73–74 in *Principles of Mathematics 11*.

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- Enter "printable protractor" into a search engine if you need a protractor.

USB Drive

Multimedia

- A video demonstration of using a protractor to draw parallel lines is provided.

b. Explain how you know your parallel lines are parallel.

_____

_____

_____

c. Create the text for the poster.

⑥   5.   Eratosthenes was a Greek scholar who lived in the third century BC. He came up with a clever
           way to indirectly measure the circumference of the Earth.

           Eratosthenes knew that in Aswan the sun was directly overhead at noon on the summer solstice.
           At the same time, he measured the angle of the sun to a vertical line in Alexandria. He found this
           angle to be $\frac{1}{50}$ of a circle.
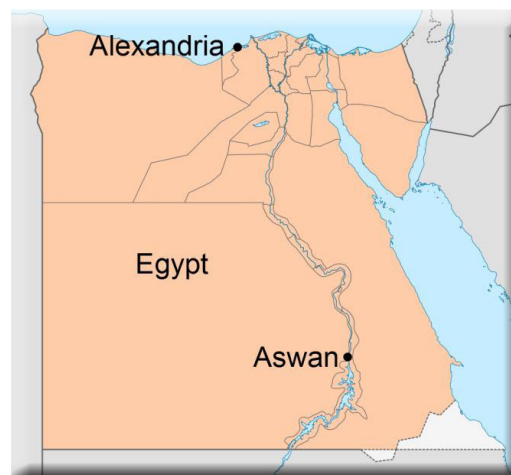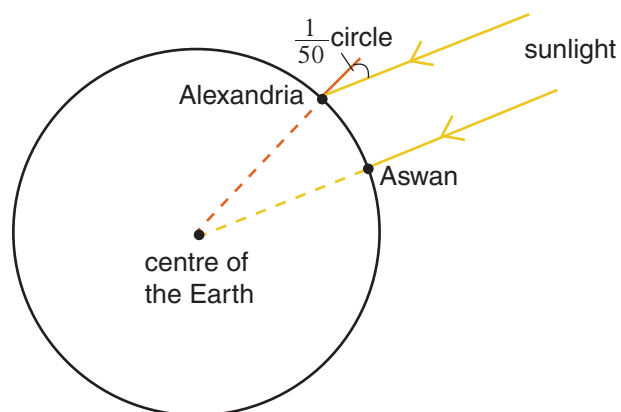
http://en.wikipedia.org/wiki/File:Egypt_location_map.svg#filelinks

           a.   What was Eratosthenes's measurement in degrees? (Hint: There are 360° in a complete
                 circle.)

           b.   What can you conclude about the angle formed between the two cities and the centre of the
                 Earth?

                 _____

                 _____

                 _____

                 _____

c.   Suppose Eratosthenes estimated the distance from Aswan and Alexandria to be 900 km. What circumference would he have found for the Earth?

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You have completed *Lesson 4.1* Assignment *Game On!*. Please return to the *Module* and continue your training with *Lesson 4.2*.