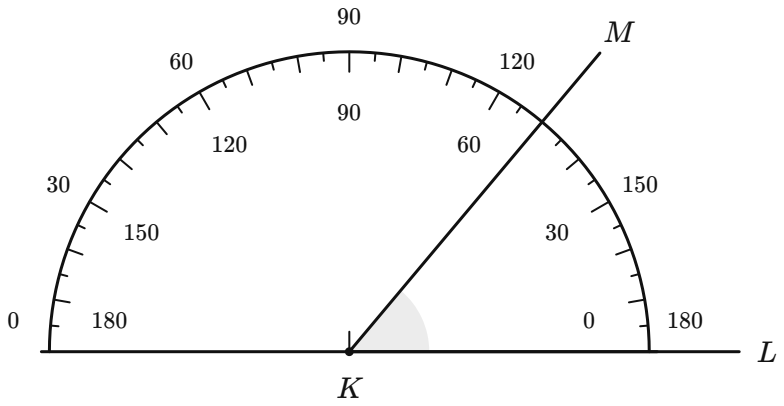
Grade 4 Unit 11 worksheet: Measuring and drawing angles with a protractor

Name _____ Date _____ Period _____

1. Mason is building a model house. In the figure, arm KL runs along the flat top of a wall and arm KM runs along one slanted edge of the roof. A protractor is laid on the angle with its center mark on K.



(a) Which row of numbers has its 0 on arm KL, the inner row or the outer row?

(b) Find $m\angle LKM$.

(c) What number does the other row show where arm KM crosses the curved edge?

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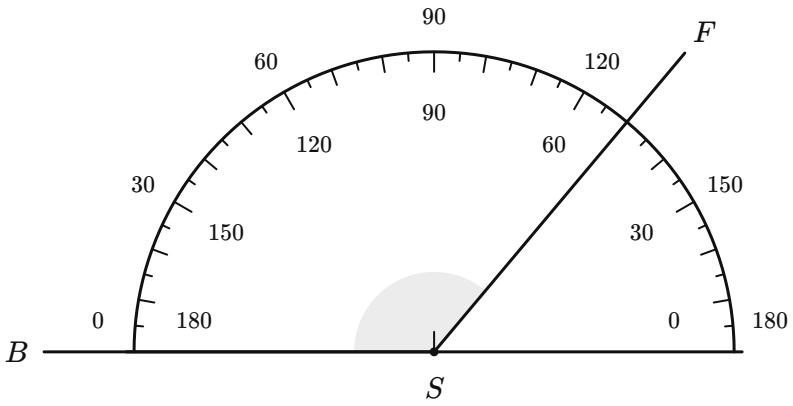
2. Mei has a toy protractor. Its numbers go 0, 20, 40, and so on up to 180. Between two numbers next to each other there are 3 small marks, evenly spaced.

(a) How many degrees does each space between two marks stand for?

(b) Mei lines up an angle correctly. Its other arm crosses at the third small mark past the 60, on the row whose 0 is on the first arm. What is the angle?

(c) Mei wants to draw a 135° angle. Past which number, and at which small mark, does her dot go?

3. Lucas opens a book and looks at it from one end. The back cover lies flat on the table, along arm SB, and the front cover is arm SF. He lays a protractor on the angle at the spine S, as in the figure.

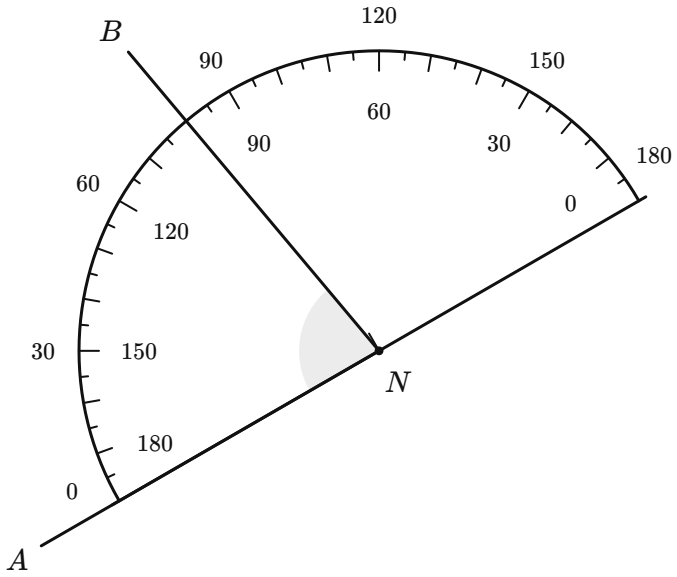


(a) Find $m\angle BSF$.

(b) Lucas first wrote 50°. What did he do wrong?

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4. Zoe sketches her toy crocodile with its mouth wide open. In the figure, N is the hinge at the back of the jaws, arm NA runs along the lower jaw and arm NB along the upper jaw. Neither arm runs across the page, so she turns the protractor until its center mark is on N and its base line lies along NA.



Find $m\angle ANB$. Say which row you read, and why.

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5. Use a ruler and a protractor.

(a) Draw a segment $\overline{AB}$, 8 centimeters long, across the page, with A on the left.

(b) At A, draw a ray above $\overline{AB}$ that makes a 50° angle with $\overrightarrow{AB}$. At B, draw a ray above $\overline{AB}$ that makes a 60° angle with $\overrightarrow{BA}$. Label the point where the two rays cross C.

(c) Measure $\angle ACB$. Write which row you read.

6. Layla wants to draw a 50° angle. She draws a ray pointing left, puts the center mark on its endpoint and the base line along the ray. Then she counts up the inner row to 50, makes her dot there, and joins it to the endpoint.

(a) What size is the angle Layla drew?

(b) Where should her dot have gone?

(c) How could an estimate have warned her?

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