

Circle Cutout Angles

Connect parts of a turn to angle measures.

GRADE 4 • TEKS 4.7.A

4.7.A "illustrate the measure of an angle as the part of a circle whose center is at the vertex of the angle that is "cut out" by the rays of the angle. Angle measures are limited to whole numbers;"

NAME _____

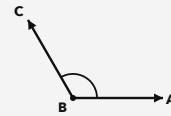
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PARTS OF A FULL TURN

An angle's vertex is like the center of a circle, and its two rays cut out part of one full turn. A full circle measures 360° , so multiply the fraction of the circle by 360 to find the angle measure. Divide an angle measure by 360 to find the fraction of the full circle.

WORKED EXAMPLE

The angle shown cuts out $\frac{1}{3}$ of a full circle. What is the measure of angle ABC?

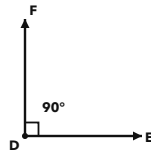


1. A full circle measures 360° .
2. Find $\frac{1}{3}$ of 360: $360 \div 3 = 120$.
3. $m \angle ABC = 120^\circ$.

Answer: 120°

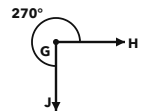
PRACTICE 6 problems

- 1** What fraction of a full circle is cut out by the marked angle in the figure?



ANSWER _____

- 2** What fraction of a full circle is cut out by the marked angle in the figure?



ANSWER _____

- 3** An angle cuts out $\frac{1}{2}$ of a full circle. What is its measure?

ANSWER _____

- 4** An angle cuts out $\frac{1}{6}$ of a full circle. What is its measure?

ANSWER _____

- 5** An angle measures 45° . What fraction of a full circle does it cut out?

ANSWER _____

- 6** An angle cuts out $\frac{5}{12}$ of a full circle. What is its measure?

ANSWER _____

APPLY IT Show your work

- 1** A game designer makes a spinner for a board game. The treasure section cuts out $\frac{2}{3}$ of the full circle. What is the angle measure of the treasure section?

WORK SPACE

ANSWER _____

- 2** Lena programs her robot to turn 135° from its starting ray. What fraction of a full circle does the robot turn?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Three rays from the same center cut a circle into three angles. Two angles measure 100° and 116° . Find the measure of the third angle and the fraction of the full circle it cuts out. Explain your reasoning.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	What fraction of a full circle is cut out by the marked angle in the figure?	1/4
2	What fraction of a full circle is cut out by the marked angle in the figure?	3/4
3	An angle cuts out 1/2 of a full circle. What is its measure?	180°
4	An angle cuts out 1/6 of a full circle. What is its measure?	60°
5	An angle measures 45°. What fraction of a full circle does it cut out?	1/8
6	An angle cuts out 5/12 of a full circle. What is its measure?	150°

PART 2 • APPLY IT

1. **240°** Find $\frac{2}{3}$ of 360. $360 \div 3 = 120$, and $120 \times 2 = 240$.
2. **3/8** Write the turn as $\frac{135}{360}$ of a circle. Divide both numbers by 45 to get $\frac{3}{8}$.

CHALLENGE

The third angle is 144°, which is $\frac{2}{5}$ of a full circle, because $360 - 100 - 116 = 144$ and $144/360 = \frac{2}{5}$.

Accept equivalent fractions, such as $\frac{2}{8}$ for $\frac{1}{4}$ or $\frac{6}{8}$ for $\frac{3}{4}$. Angle measures should include the degree symbol.