

# Angles as Fractions of a Circle

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 24

## Q Quick Review

An **angle** is the amount of turn between two rays that share a corner. We measure angles in **degrees**, written with a little circle like  $90^\circ$ . Picture the angle sitting at the center of a circle. A full circle all the way around is  $360^\circ$ . So an angle that turns through  $\frac{1}{360}$  of a circle measures exactly  $1^\circ$ . To find the degrees in a fraction of a circle, multiply that fraction by 360. For example, a  $\frac{1}{4}$  turn is  $\frac{1}{4} \times 360 = 90^\circ$ , which is a square corner.

◊ **Example:** An angle turns through  $\frac{1}{6}$  of a full circle. How many degrees does it measure?  
 ⇒ A full circle is  $360^\circ$ , and this angle is  $\frac{1}{6}$  of that. To take  $\frac{1}{6}$  of something, divide it into 6 equal parts:  $360 \div 6 = 60$ . So the angle measures  $60^\circ$ . You can check it: 6 angles of  $60^\circ$  each make  $6 \times 60 = 360^\circ$ , one whole circle.

**Answer:**  $60^\circ$

## PRACTICE

Find the degree measure of each angle described as a fraction of a full circle.

- |  |       |   |       |
|--|-------|---|-------|
| 1. Degrees in $\frac{1}{2}$ of a circle  | _____ | 11. Degrees in $\frac{2}{3}$ of a circle  | _____ |
| 2. Degrees in $\frac{1}{4}$ of a circle  | _____ | 12. Degrees in $\frac{2}{6}$ of a circle  | _____ |
| 3. Degrees in $\frac{1}{3}$ of a circle  | _____ | 13. Degrees in $\frac{3}{6}$ of a circle  | _____ |
| 4. Degrees in $\frac{1}{6}$ of a circle  | _____ | 14. Degrees in $\frac{2}{5}$ of a circle  | _____ |
| 5. Degrees in $\frac{1}{5}$ of a circle  | _____ | 15. Degrees in $\frac{3}{8}$ of a circle  | _____ |
| 6. Degrees in $\frac{1}{8}$ of a circle  | _____ | 16. Degrees in $\frac{5}{6}$ of a circle  | _____ |
| 7. Degrees in $\frac{1}{9}$ of a circle  | _____ | 17. Degrees in $\frac{4}{9}$ of a circle  | _____ |
| 8. Degrees in $\frac{1}{10}$ of a circle | _____ | 18. Degrees in $\frac{5}{12}$ of a circle | _____ |
| 9. Degrees in $\frac{1}{12}$ of a circle | _____ | 19. Degrees in $\frac{7}{10}$ of a circle | _____ |
| 10. Degrees in $\frac{3}{4}$ of a circle | _____ | 20. Degrees in $\frac{7}{12}$ of a circle | _____ |

## ◆ Word Problems

21. Maria spins the pointer on a board game. It makes a  $\frac{1}{4}$  turn before it stops. How many degrees did the pointer turn? \_\_\_\_\_
22. A pizza is cut into 8 equal slices. The angle at the pointy tip of one slice is what fraction of a circle, and how many degrees is it? \_\_\_\_\_
23. The minute hand of a clock moves from the 12 all the way around to the 4. That is  $\frac{4}{12}$  of a full turn. How many degrees did the minute hand sweep through? \_\_\_\_\_
24. A skateboarder does a trick that turns him  $\frac{1}{2}$  of the way around. His friend turns  $\frac{3}{4}$  of the way around. How many more degrees did the friend turn? \_\_\_\_\_



## Answer Keys

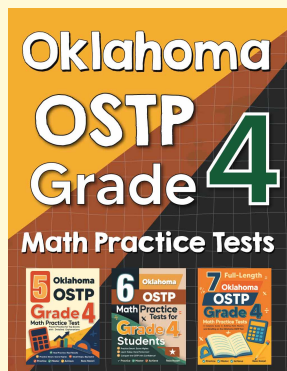
- |                                       |   |
|---------------------------------------|---|
| 1. <input type="text" value="180°"/>  | 13. <input type="text" value="180°"/>                 |
| 2. <input type="text" value="90°"/>   | 14. <input type="text" value="144°"/>                 |
| 3. <input type="text" value="120°"/>  | 15. <input type="text" value="135°"/>                 |
| 4. <input type="text" value="60°"/>   | 16. <input type="text" value="300°"/>                 |
| 5. <input type="text" value="72°"/>   | 17. <input type="text" value="160°"/>                 |
| 6. <input type="text" value="45°"/>   | 18. <input type="text" value="150°"/>                 |
| 7. <input type="text" value="40°"/>   | 19. <input type="text" value="252°"/>                 |
| 8. <input type="text" value="36°"/>   | 20. <input type="text" value="210°"/>                 |
| 9. <input type="text" value="30°"/>   | 21. <input type="text" value="90°"/>                  |
| 10. <input type="text" value="270°"/> | 22. <input type="text" value="1/8 of a circle, 45°"/> |
| 11. <input type="text" value="240°"/> | 23. <input type="text" value="120°"/>                 |
| 12. <input type="text" value="120°"/> | 24. <input type="text" value="90° more"/>             |

### Step-by-Step Explanations

- |   |  |
|---|--|
| <p>1. Half of a <math>360^\circ</math> circle is <math>360 \div 2 = 180^\circ</math>.</p> <p>2. One quarter of <math>360^\circ</math> is <math>360 \div 4 = 90^\circ</math>, a square corner.</p> <p>3. One third of <math>360^\circ</math> is <math>360 \div 3 = 120^\circ</math>.</p> <p>4. One sixth of <math>360^\circ</math> is <math>360 \div 6 = 60^\circ</math>.</p> <p>5. One fifth of <math>360^\circ</math> is <math>360 \div 5 = 72^\circ</math>.</p> <p>6. One eighth of <math>360^\circ</math> is <math>360 \div 8 = 45^\circ</math>.</p> <p>7. One ninth of <math>360^\circ</math> is <math>360 \div 9 = 40^\circ</math>.</p> <p>8. One tenth of <math>360^\circ</math> is <math>360 \div 10 = 36^\circ</math>.</p> <p>9. One twelfth of <math>360^\circ</math> is <math>360 \div 12 = 30^\circ</math>.</p> <p>10. One quarter is <math>90^\circ</math>, so three quarters is <math>3 \times 90 = 270^\circ</math>.</p> <p>11. One third is <math>120^\circ</math>, so two thirds is <math>2 \times 120 = 240^\circ</math>.</p> <p>12. One sixth is <math>60^\circ</math>, so two sixths is <math>2 \times 60 = 120^\circ</math>.</p> <p>13. One sixth is <math>60^\circ</math>, so three sixths is <math>3 \times 60 = 180^\circ</math>, a half turn.</p> | <p>14. One fifth is <math>72^\circ</math>, so two fifths is <math>2 \times 72 = 144^\circ</math>.</p> <p>15. One eighth is <math>45^\circ</math>, so three eighths is <math>3 \times 45 = 135^\circ</math>.</p> <p>16. One sixth is <math>60^\circ</math>, so five sixths is <math>5 \times 60 = 300^\circ</math>.</p> <p>17. One ninth is <math>40^\circ</math>, so four ninths is <math>4 \times 40 = 160^\circ</math>.</p> <p>18. One twelfth is <math>30^\circ</math>, so five twelfths is <math>5 \times 30 = 150^\circ</math>.</p> <p>19. One tenth is <math>36^\circ</math>, so seven tenths is <math>7 \times 36 = 252^\circ</math>.</p> <p>20. One twelfth is <math>30^\circ</math>, so seven twelfths is <math>7 \times 30 = 210^\circ</math>.</p> <p>21. A full spin is <math>360^\circ</math>. A <math>\frac{1}{4}</math> turn is <math>360 \div 4 = 90^\circ</math>.</p> <p>22. Each slice is one of 8 equal parts, so it is <math>\frac{1}{8}</math> of the circle. That is <math>360 \div 8 = 45^\circ</math>.</p> <p>23. One twelfth of a circle is <math>360 \div 12 = 30^\circ</math>. Moving <math>\frac{4}{12}</math> of the way is <math>4 \times 30 = 120^\circ</math>.</p> <p>24. A half turn is <math>360 \div 2 = 180^\circ</math>. A <math>\frac{3}{4}</math> turn is <math>3 \times 90 = 270^\circ</math>. The difference is <math>270 - 180 = 90^\circ</math>.</p> |
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