

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° . Picture the angle sitting at the center of a circle. A full circle all the way around is 360° . So an angle that turns through $\frac{1}{360}$ of a circle measures exactly 1° . 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° , 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° . You can check it: 6 angles of 60° each make $6 \times 60 = 360^\circ$, one whole circle.

Answer: 60°

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

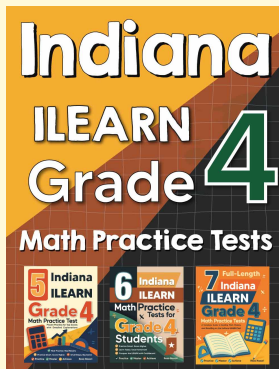
- | | |
|---------------------------------------|---|
| 1. <input type="text" value="180°"/> | 13. <input type="text" value="180°"/> |
| 2. <input type="text" value="90°"/> | 14. <input type="text" value="144°"/> |
| 3. <input type="text" value="120°"/> | 15. <input type="text" value="135°"/> |
| 4. <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

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