

Adding and Subtracting Angles

Name: _____ Date: _____ Score: _____ / 24

Q Quick Review

When a big angle is split into smaller angles that sit right next to each other, the small angles **add up** to the whole. This means you can add angle measures to find the total, or subtract to find a missing part. If a 90° angle is split into a 35° piece and another piece, the missing piece is $90 - 35 = 55^\circ$. The same idea works with a straight angle of 180° or a full circle of 360° . The key question is always: *what do the parts add up to?* Then add the parts you know, or subtract from the whole.

◇ **Example:** A 90° angle is split into two smaller angles. One part measures 52° . What is the measure of the other part?
 ⇒ The two parts together make the whole 90° angle. One part is 52° , so to find the other part we take it away from the whole: $90 - 52 = 38$. The missing angle is 38° . You can check by adding the parts back together: $52 + 38 = 90^\circ$.

Answer: 38°

PRACTICE

Add or subtract to find the total angle or the missing part. Answers are in degrees.

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|--|-------|---|-------|
| 1. $40^\circ + 30^\circ$ | _____ | 11. A 180° angle split into 75° and _____ | _____ |
| 2. $25^\circ + 25^\circ$ | _____ | 12. A 180° angle split into 45° and _____ | _____ |
| 3. $60^\circ + 45^\circ$ | _____ | 13. A 120° angle split into 85° and _____ | _____ |
| 4. $90^\circ + 35^\circ$ | _____ | 14. A 150° angle split into 90° and _____ | _____ |
| 5. $115^\circ + 50^\circ$ | _____ | 15. $35^\circ + 40^\circ + 25^\circ$ | _____ |
| 6. A 90° angle split into 40° and _____ | _____ | 16. $50^\circ + 60^\circ + 30^\circ$ | _____ |
| 7. A 90° angle split into 55° and _____ | _____ | 17. A 180° angle split into 60° , 70° , and _____ | _____ |
| 8. A 90° angle split into 18° and _____ | _____ | 18. A 360° circle split into 200° and _____ | _____ |
| 9. A 90° angle split into 63° and _____ | _____ | 19. A 360° circle split into 90° , 90° , and _____ | _____ |
| 10. A 180° angle split into 110° and _____ | _____ | 20. A 145° angle split into 68° and _____ | _____ |

◆ Word Problems

21. A door swings open through a 90° angle. Halfway through, it has swung 38° . How many more degrees must it swing to be fully open? _____
22. Nina folds a paper fan so its full opening is 180° . One section opens 65° and the rest is a second section. How many degrees is the second section? _____
23. A slice of pie has a tip angle of 40° . Two slices are placed side by side on a plate. What is the total angle the two slices cover? _____
24. At the center of a pinwheel, three angles meet to fill a full circle of 360° . Two of the angles are 130° and 115° . What is the measure of the third angle? _____



Answer Keys

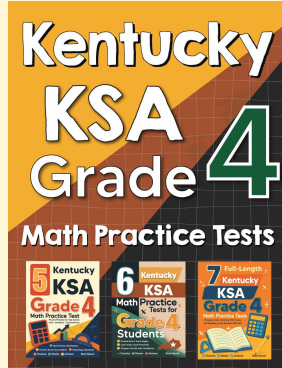
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|---------------------------------------|---------------------------------------|
| 1. <input type="text" value="70°"/> | 13. <input type="text" value="35°"/> |
| 2. <input type="text" value="50°"/> | 14. <input type="text" value="60°"/> |
| 3. <input type="text" value="105°"/> | 15. <input type="text" value="100°"/> |
| 4. <input type="text" value="125°"/> | 16. <input type="text" value="140°"/> |
| 5. <input type="text" value="165°"/> | 17. <input type="text" value="50°"/> |
| 6. <input type="text" value="50°"/> | 18. <input type="text" value="160°"/> |
| 7. <input type="text" value="35°"/> | 19. <input type="text" value="180°"/> |
| 8. <input type="text" value="72°"/> | 20. <input type="text" value="77°"/> |
| 9. <input type="text" value="27°"/> | 21. <input type="text" value="52°"/> |
| 10. <input type="text" value="70°"/> | 22. <input type="text" value="115°"/> |
| 11. <input type="text" value="105°"/> | 23. <input type="text" value="80°"/> |
| 12. <input type="text" value="135°"/> | 24. <input type="text" value="115°"/> |

Step-by-Step Explanations

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| <p>1. Add the two angle measures: $40 + 30 = 70^\circ$.</p> <p>2. Add the two angle measures: $25 + 25 = 50^\circ$.</p> <p>3. Add the two angle measures: $60 + 45 = 105^\circ$.</p> <p>4. Add the two angle measures: $90 + 35 = 125^\circ$.</p> <p>5. Add the two angle measures: $115 + 50 = 165^\circ$.</p> <p>6. The parts add to 90°, so the missing part is $90 - 40 = 50^\circ$.</p> <p>7. The parts add to 90°, so the missing part is $90 - 55 = 35^\circ$.</p> <p>8. The parts add to 90°, so the missing part is $90 - 18 = 72^\circ$.</p> <p>9. The parts add to 90°, so the missing part is $90 - 63 = 27^\circ$.</p> <p>10. The parts add to 180°, so the missing part is $180 - 110 = 70^\circ$.</p> <p>11. The parts add to 180°, so the missing part is $180 - 75 = 105^\circ$.</p> <p>12. The parts add to 180°, so the missing part is $180 - 45 = 135^\circ$.</p> <p>13. The parts add to 120°, so the missing part is $120 - 85 = 35^\circ$.</p> <p>14. The parts add to 150°, so the missing part is $150 - 90 = 60^\circ$.</p> | <p>15. Add all three parts: $35 + 40 = 75$, then $75 + 25 = 100^\circ$.</p> <p>16. Add all three parts: $50 + 60 = 110$, then $110 + 30 = 140^\circ$.</p> <p>17. The three parts add to 180°. Since $60 + 70 = 130$, the missing part is $180 - 130 = 50^\circ$.</p> <p>18. The parts add to a full circle, 360°, so the missing part is $360 - 200 = 160^\circ$.</p> <p>19. The parts add to 360°. Since $90 + 90 = 180$, the missing part is $360 - 180 = 180^\circ$.</p> <p>20. The parts add to 145°, so the missing part is $145 - 68 = 77^\circ$.</p> <p>21. The full swing is 90° and it has gone 38°, so it has $90 - 38 = 52^\circ$ left to go.</p> <p>22. The two sections add to 180°. The second section is $180 - 65 = 115^\circ$.</p> <p>23. Place the two angles next to each other and add: $40 + 40 = 80^\circ$.</p> <p>24. The three angles add to 360°. Since $130 + 115 = 245$, the third angle is $360 - 245 = 115^\circ$.</p> |
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