

# 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  $90^\circ$  angle is split into a  $35^\circ$  piece and another piece, the missing piece is  $90 - 35 = 55^\circ$ . The same idea works with a straight angle of  $180^\circ$  or a full circle of  $360^\circ$ . 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  $90^\circ$  angle is split into two smaller angles. One part measures  $52^\circ$ . What is the measure of the other part?  
 $\Rightarrow$  The two parts together make the whole  $90^\circ$  angle. One part is  $52^\circ$ , so to find the other part we take it away from the whole:  $90 - 52 = 38$ . The missing angle is  $38^\circ$ . You can check by adding the parts back together:  $52 + 38 = 90^\circ$ .

Answer:  $38^\circ$ 

## PRACTICE

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

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

## ◆ Word Problems

21. A door swings open through a  $90^\circ$  angle. Halfway through, it has swung  $38^\circ$ . How many more degrees must it swing to be fully open? \_\_\_\_\_
22. Nina folds a paper fan so its full opening is  $180^\circ$ . One section opens  $65^\circ$  and the rest is a second section. How many degrees is the second section? \_\_\_\_\_
23. A slice of pie has a tip angle of  $40^\circ$ . 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  $360^\circ$ . Two of the angles are  $130^\circ$  and  $115^\circ$ . What is the measure of the third angle? \_\_\_\_\_



## Answer Keys

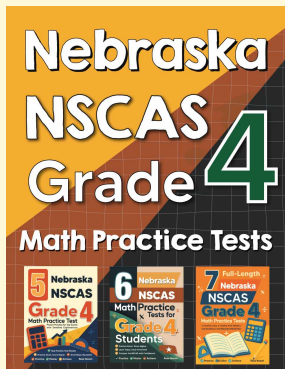
- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| 1. <input type="text" value="70°"/>   | 13. <input type="text" value="35°"/>  |
| 2. <input type="text" value="50°"/>   | 14. <input 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

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



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