# Adding and Subtracting Angles

| Name: _____ | Date: _____ | Score: _____ / 24 |
|---|---|---|

## 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 $90 - 35 = 55°$. 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: $52 + 38 = 90°$.

**Answer:** $38°$

## PRACTICE

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

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

1. $70°$
2. $50°$
3. $105°$
4. $125°$
5. $165°$
6. $50°$
7. $35°$
8. $72°$
9. $27°$
10. $70°$
11. $105°$
12. $135°$
13. $35°$
14. $60°$
15. $100°$
16. $140°$
17. $50°$
18. $160°$
19. $180°$
20. $77°$
21. $52°$
22. $115°$
23. $80°$
24. $115°$

## Step-by-Step Explanations

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

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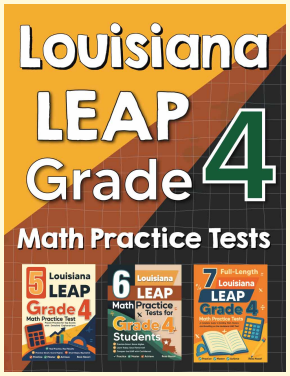


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