

# Drawing Angles with Given Measures

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

## Q Quick Review

To **draw an angle** with a protractor, start by drawing one ray and lining up the protractor’s center on its endpoint. Then count up from  $0^\circ$  to the measure you want and make a mark, and draw the second ray to that mark. Before you draw, it helps to picture the angle: an **acute** angle (under  $90^\circ$ ) is narrow, a **right** angle is exactly  $90^\circ$ , and an **obtuse** angle (over  $90^\circ$ ) is wide. Knowing the type tells you roughly how open your drawing should look. Two angle measures that add up to  $90^\circ$  together make a square corner.

◇ **Example:** You need to draw an angle that is  $40^\circ$ . What type of angle is it, and how much smaller is it than a right angle?  
 ⇒ First decide the type. Since  $40^\circ$  is less than  $90^\circ$ , it is an acute angle, so your drawing should look narrow. To see how much smaller it is than a right angle, subtract from 90:  $90 - 40 = 50$ . So a  $40^\circ$  angle is  $50^\circ$  less open than a square corner.

**Answer:** acute,  $50^\circ$  less than a right angle

## PRACTICE

Name the type of each angle you would draw, or find the measure described.

- |   |  |
|---|--|
| 1. Type of a $20^\circ$ angle _____                           | 12. An angle that is $20^\circ$ more than a right angle _____    |
| 2. Type of a $90^\circ$ angle _____                           | 13. An angle that is $15^\circ$ less than a right angle _____    |
| 3. Type of a $130^\circ$ angle _____                          | 14. An angle that is $45^\circ$ more than a right angle _____    |
| 4. Type of a $70^\circ$ angle _____                           | 15. An angle that is half of a right angle _____                 |
| 5. Type of a $160^\circ$ angle _____                          | 16. An angle that is twice a $40^\circ$ angle _____              |
| 6. Type of a $35^\circ$ angle _____                           | 17. An angle that is $25^\circ$ more than a right angle _____    |
| 7. Type of a $105^\circ$ angle _____                          | 18. An angle that with $60^\circ$ makes a right angle _____      |
| 8. Type of a $50^\circ$ angle _____                           | 19. An angle that with $25^\circ$ makes a right angle _____      |
| 9. Type of a $140^\circ$ angle _____                          | 20. An angle that is $10^\circ$ less than a straight angle _____ |
| 10. Type of a $10^\circ$ angle _____                          |  |
| 11. An angle that is $30^\circ$ less than a right angle _____ |  |

### ◆ Word Problems

21. Leo wants to draw an angle of  $55^\circ$  for an art project. What type of angle should he draw, and how much less open is it than a right angle? \_\_\_\_\_
22. A coach draws a play with an angle that is  $30^\circ$  wider than a right angle. What is the measure of that angle? \_\_\_\_\_
23. Ava needs to draw a  $90^\circ$  angle but only knows how to draw  $45^\circ$  angles. How many  $45^\circ$  angles placed side by side make the  $90^\circ$  angle? \_\_\_\_\_
24. On a worksheet, Sam must draw an angle that with a  $35^\circ$  angle adds up to a straight angle. What measure should Sam draw? \_\_\_\_\_



## Answer Keys

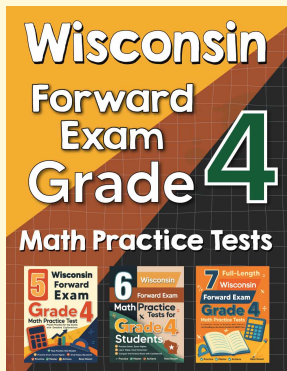
- |                 |                            |
|-----------------|----------------------------|
| 1. acute        | 13. $75^\circ$             |
| 2. right        | 14. $135^\circ$            |
| 3. obtuse       | 15. $45^\circ$             |
| 4. acute        | 16. $80^\circ$             |
| 5. obtuse       | 17. $115^\circ$            |
| 6. acute        | 18. $30^\circ$             |
| 7. obtuse       | 19. $65^\circ$             |
| 8. acute        | 20. $170^\circ$            |
| 9. obtuse       | 21. acute, $35^\circ$ less |
| 10. acute       | 22. $120^\circ$            |
| 11. $60^\circ$  | 23. 2 angles               |
| 12. $110^\circ$ | 24. $145^\circ$            |

### Step-by-Step Explanations

- |   |   |
|---|---|
| <p>1. Since <math>20^\circ</math> is less than <math>90^\circ</math>, you would draw an acute angle.</p> <p>2. An angle of exactly <math>90^\circ</math> is a right angle, a square corner.</p> <p>3. Since <math>130^\circ</math> is more than <math>90^\circ</math>, you would draw an obtuse angle.</p> <p>4. Since <math>70^\circ</math> is less than <math>90^\circ</math>, you would draw an acute angle.</p> <p>5. Since <math>160^\circ</math> is more than <math>90^\circ</math>, you would draw an obtuse angle.</p> <p>6. Since <math>35^\circ</math> is less than <math>90^\circ</math>, you would draw an acute angle.</p> <p>7. Since <math>105^\circ</math> is more than <math>90^\circ</math>, you would draw an obtuse angle.</p> <p>8. Since <math>50^\circ</math> is less than <math>90^\circ</math>, you would draw an acute angle.</p> <p>9. Since <math>140^\circ</math> is more than <math>90^\circ</math>, you would draw an obtuse angle.</p> <p>10. Since <math>10^\circ</math> is less than <math>90^\circ</math>, you would draw an acute angle.</p> <p>11. A right angle is <math>90^\circ</math>, so <math>90 - 30 = 60^\circ</math>.</p> <p>12. A right angle is <math>90^\circ</math>, so <math>90 + 20 = 110^\circ</math>.</p> | <p>13. A right angle is <math>90^\circ</math>, so <math>90 - 15 = 75^\circ</math>.</p> <p>14. A right angle is <math>90^\circ</math>, so <math>90 + 45 = 135^\circ</math>.</p> <p>15. Half of <math>90^\circ</math> is <math>90 \div 2 = 45^\circ</math>.</p> <p>16. Twice <math>40^\circ</math> is <math>2 \times 40 = 80^\circ</math>.</p> <p>17. A right angle is <math>90^\circ</math>, so <math>90 + 25 = 115^\circ</math>.</p> <p>18. A right angle is <math>90^\circ</math>, so the missing part is <math>90 - 60 = 30^\circ</math>.</p> <p>19. A right angle is <math>90^\circ</math>, so the missing part is <math>90 - 25 = 65^\circ</math>.</p> <p>20. A straight angle is <math>180^\circ</math>, so <math>180 - 10 = 170^\circ</math>.</p> <p>21. <math>55^\circ</math> is less than <math>90^\circ</math>, so it is acute. It is <math>90 - 55 = 35^\circ</math> less open than a right angle.</p> <p>22. A right angle is <math>90^\circ</math>. An angle <math>30^\circ</math> wider is <math>90 + 30 = 120^\circ</math>.</p> <p>23. Each angle is <math>45^\circ</math>, and <math>45 + 45 = 90^\circ</math>, so 2 of them make a right angle.</p> <p>24. A straight angle is <math>180^\circ</math>. The missing part is <math>180 - 35 = 145^\circ</math>.</p> |
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