

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° 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°) is narrow, a **right** angle is exactly 90° , and an **obtuse** angle (over 90°) is wide. Knowing the type tells you roughly how open your drawing should look. Two angle measures that add up to 90° together make a square corner.

◇ **Example:** You need to draw an angle that is 40° . What type of angle is it, and how much smaller is it than a right angle?
 ⇒ First decide the type. Since 40° is less than 90° , 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° angle is 50° less open than a square corner.

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

◆ Word Problems

21. Leo wants to draw an angle of 55° 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° wider than a right angle. What is the measure of that angle? _____
23. Ava needs to draw a 90° angle but only knows how to draw 45° angles. How many 45° angles placed side by side make the 90° angle? _____
24. On a worksheet, Sam must draw an angle that with a 35° angle adds up to a straight angle. What measure should Sam draw? _____



Answer Keys

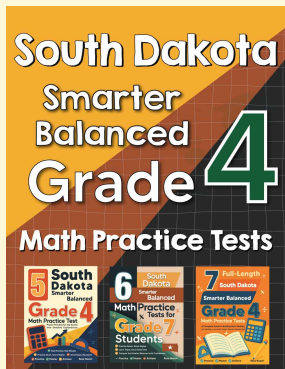
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|-----------------|----------------------------|
| 1. acute | 13. 75° |
| 2. right | 14. 135° |
| 3. obtuse | 15. 45° |
| 4. acute | 16. 80° |
| 5. obtuse | 17. 115° |
| 6. acute | 18. 30° |
| 7. obtuse | 19. 65° |
| 8. acute | 20. 170° |
| 9. obtuse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

Step-by-Step Explanations

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