

Parallel and Perpendicular Lines

Name: _____ Date: _____ Score: _____ / 24

Q Quick Review

Lines can have special relationships with each other. **Parallel lines** are always the same distance apart and never cross, no matter how far they go — think of the two long rails of a train track. **Perpendicular lines** cross each other and make a *right angle* (90°) where they meet, like the corner of a window. Lines that cross but do *not* make a right angle are called **intersecting lines**. A quick way to remember: parallel lines stay apart forever, while perpendicular lines meet to form a perfect square corner.

◇ **Example:** Two lines cross each other, and the angle where they meet measures exactly 90° . What is the relationship between the two lines?
 ⇒ First notice that the lines do cross, so they are at least intersecting. The special clue is the angle at the crossing point: it is exactly 90° , a right angle. Lines that cross and form a right angle have a special name — they are perpendicular. So these two lines are perpendicular.

Answer: perpendicular

PRACTICE

Name the relationship between the lines or describe the figure in each problem.

- | | |
|--|--|
| 1. Two lines that never cross and stay the same distance apart _____ | 2. Two roads that cross at a slanted, non-square corner _____ |
| 2. Two lines that cross and form a 90° angle _____ | 14. The shelves of a tall bookcase _____ |
| 3. The two long rails of a train track _____ | 15. The lines of the letter T _____ |
| 4. The corner where two walls of a room meet _____ | 16. Two lines that will never meet no matter how far they go _____ |
| 5. Two lines that cross but do not make a 90° angle _____ | 17. The hands of a clock at 3:00 _____ |
| 6. The top and bottom edges of a chalkboard _____ | 18. Two pencils laid down so they cross like a slanted X _____ |
| 7. The two lines that form a plus sign + _____ | 19. The two sides of a road that a car drives between _____ |
| 8. The lines of the letter X _____ | 20. The lines that form the corner of a picture frame _____ |
| 9. The opposite sides of a rectangle _____ | |
| 10. Two sides of a rectangle that share a corner _____ | |
| 11. The two long edges of a ruler _____ | |
| 12. Lines that meet to form a perfect square corner _____ | |

◆ Word Problems

21. Liam is drawing a map. He draws Maple Street and Oak Street so they cross each other and form a perfect 90° corner. What is the relationship between the two streets? _____
22. On the soccer field, the two long sidelines run straight down the field and never get closer together or cross. What kind of lines are the two sidelines? _____
23. Sofia notices that the floor and one wall of her classroom meet to form a square corner. What is the relationship between the floor and that wall? _____
24. Noah draws two lines that cross in the middle of his page, but the angles they make are not square corners. What is the best name for these two lines? _____



Answer Keys

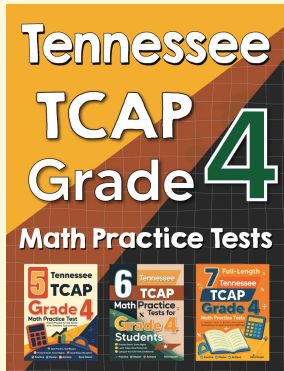
- | | |
|-------------------|------------------------|
| 1. parallel | 13. intersecting |
| 2. perpendicular | 14. parallel |
| 3. parallel | 15. perpendicular |
| 4. perpendicular | 16. parallel |
| 5. intersecting | 17. perpendicular |
| 6. parallel | 18. intersecting |
| 7. perpendicular | 19. parallel |
| 8. intersecting | 20. perpendicular |
| 9. parallel | 21. perpendicular |
| 10. perpendicular | 22. parallel lines |
| 11. parallel | 23. perpendicular |
| 12. perpendicular | 24. intersecting lines |

Step-by-Step Explanations

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|---|---|
| <p>1. Lines that never meet and stay equally apart are parallel.</p> <p>2. Crossing at a right angle of 90° makes the lines perpendicular.</p> <p>3. Train rails stay the same distance apart forever, so they are parallel.</p> <p>4. Walls meet at a square corner of 90°, so they are perpendicular.</p> <p>5. They cross but the angle is not a right angle, so they are simply intersecting.</p> <p>6. The top and bottom edges stay the same distance apart, so they are parallel.</p> <p>7. A plus sign is made of two lines crossing at 90°, so they are perpendicular.</p> <p>8. The two strokes of an X cross, but not at a right angle, so they are intersecting.</p> <p>9. Opposite sides of a rectangle never meet and stay equally apart — parallel.</p> <p>10. Sides that meet at a rectangle's corner form a 90° angle, so they are perpendicular.</p> <p>11. A ruler's long edges stay the same distance apart, so they are parallel.</p> <p>12. A perfect square corner is a right angle, so the lines are perpendicular.</p> <p>13. They cross but the corner is not square, so the roads are just intersecting.</p> <p>14. Each shelf stays the same distance from the next, so the shelves are parallel.</p> | <p>15. The line across the top of a T meets the stem at 90°, so they are perpendicular.</p> <p>16. Lines that never meet, staying equally apart, are parallel.</p> <p>17. At 3:00 the clock hands form a 90° angle, so they are perpendicular.</p> <p>18. The pencils cross but not at a right angle, so they are intersecting.</p> <p>19. The two sides of a road stay the same distance apart, so they are parallel.</p> <p>20. A picture-frame corner is a 90° angle, so those lines are perpendicular.</p> <p>21. Lines that cross and make a right angle of 90° are perpendicular, so the two streets are perpendicular.</p> <p>22. The sidelines stay the same distance apart and never meet, which means they are parallel lines.</p> <p>23. A square corner is a 90° right angle, so the floor and the wall are perpendicular.</p> <p>24. The lines cross but do not make a 90° angle, so they are simply intersecting lines.</p> |
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