

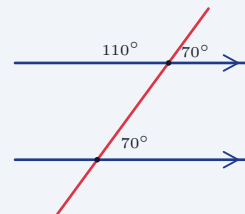
Parallel Lines and Transversals

Name: _____ Date: _____ Score: _____ / 30

Quick Review and Helpful Hints

When a transversal crosses two parallel lines, special angle pairs form: *corresponding* angles are equal, *alternate interior* angles are equal, and *alternate exterior* angles are equal. *Co-interior* (same-side interior) angles are supplementary (add to 180°), and any *linear pair* on a line is also supplementary. Vertical angles are equal.

▷ **Example:** Two parallel lines are cut by a transversal, making a 70° angle. Find its corresponding angle and its co-interior angle.
Work: Corresponding angles are equal, so one is 70° . Co-interior angles are supplementary, so the other is $180 - 70$. ★ **Answer:** 70° and 110°



Corresponding angles equal;
co-interior add to 180° .

Practice Problems

Find the measure of the requested angle.

- | | | | |
|---|-------|---|-------|
| 1. Corresponding angle of 65° | _____ | 8. Linear-pair angle of 130° | _____ |
| 2. Alternate interior angle of 80° | _____ | 9. Corresponding angle of 90° | _____ |
| 3. Co-interior angle of 110° | _____ | 10. Alternate interior angle of 35° | _____ |
| 4. Vertical angle of 45° | _____ | 11. Co-interior angle of 60° | _____ |
| 5. Corresponding angle of 120° | _____ | 12. Vertical angle of 100° | _____ |
| 6. Co-interior angle of 75° | _____ | 13. Linear-pair angle of 95° | _____ |
| 7. Alternate exterior angle of 50° | _____ | 14. Alternate exterior angle of 145° | _____ |

Word Problems

15. Two parallel lines are cut by a transversal. What is the angle corresponding to a 72° angle? _____
16. Same-side interior angles are formed by parallel lines. One is 115° . Find the other. _____
17. Alternate interior angles are formed by parallel lines. One is 48° . Find the other. _____
18. A transversal makes a 130° angle with a line. What is the angle next to it (its linear pair)? _____



◆ Illustrated Practice

Use each picture. Match the angle relationship first, then find the missing value.

19. Corresponding angles.
Find x . _____

25. Corresponding angles.
Find x . _____

20. Same-side interior angles.
Find x . _____

26. Same-side interior angles.
Find x . _____

21. Alternate interior angles.
Find x . _____

27. Alternate interior angles.
Find x . _____

22. Linear pair on l_1 . Find x . _____

28. Corresponding angles.
Find x . _____

23. Vertical angles. Find x . _____

29. Same-side interior equation. Find x . _____

24. Alternate exterior angles.
Find x . _____

30. What angle relationship is shown? _____



Answer Keys

- | | | |
|--------------------------------------|---------------------------------------|---|
| 1. <input type="text" value="65°"/> | 11. <input type="text" value="120°"/> | 21. <input type="text" value="47°"/> |
| 2. <input type="text" value="80°"/> | 12. <input type="text" value="100°"/> | 22. <input type="text" value="42°"/> |
| 3. <input type="text" value="70°"/> | 13. <input type="text" value="85°"/> | 23. <input type="text" value="76°"/> |
| 4. <input type="text" value="45°"/> | 14. <input type="text" value="145°"/> | 24. <input type="text" value="121°"/> |
| 5. <input type="text" value="120°"/> | 15. <input type="text" value="72°"/> | 25. <input type="text" value="x = 16"/> |
| 6. <input type="text" value="105°"/> | 16. <input type="text" value="65°"/> | 26. <input type="text" value="x = 22"/> |
| 7. <input type="text" value="50°"/> | 17. <input type="text" value="48°"/> | 27. <input type="text" value="x = 11"/> |
| 8. <input type="text" value="50°"/> | 18. <input type="text" value="50°"/> | 28. <input type="text" value="58°"/> |
| 9. <input type="text" value="90°"/> | 19. <input type="text" value="64°"/> | 29. <input type="text" value="x = 25"/> |
| 10. <input type="text" value="35°"/> | 20. <input type="text" value="68°"/> | 30. Alternate exterior |

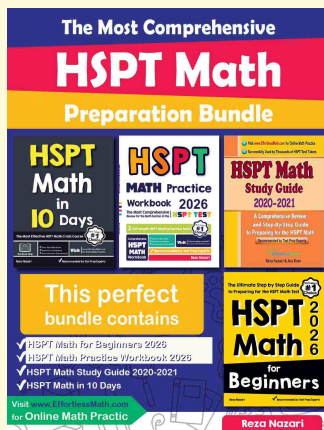
Step-by-Step Explanations

1. Corresponding angles are in the same relative position at the two crossings. Because the lines are parallel, those angles are equal, so the requested angle is 65° .
2. Alternate interior angles are inside the parallel lines and on opposite sides of the transversal. For parallel lines they are equal, so the angle measure stays 80° .
3. Co-interior angles are on the same side of the transversal between the parallel lines, so they add to 180° . Subtract the given angle: $180 - 110 = 70$, so the missing angle is 70° .
4. Vertical angles are the opposite angles made by two intersecting lines. Opposite angles match exactly, so the vertical angle is also 45° .
5. Use the corresponding-angle rule again: same position at each crossing means same measure when the lines are parallel. The corresponding angle is 120° .
6. Co-interior angles are supplementary, which means their sum is 180° . Compute $180 - 75 = 105$, so the missing angle is 105° .
7. Alternate exterior angles are outside the parallel lines and on opposite sides of the transversal. They are congruent, so the angle is 50° .
8. A linear pair forms a straight line, and a straight angle is 180° . Subtract the known angle: $180 - 130 = 50$, so the angle next to it is 50° .
9. Corresponding angles keep the same corner position at the two intersections. Since corresponding angles are equal, the answer is 90° .
10. Alternate interior angles match when the two lines are parallel. The given angle is 35° , so the alternate interior angle is also 35° .
11. Same-side interior angles are supplementary, so start from 180° and subtract the given angle. $180 - 60 = 120$, so the missing angle is 120° .
12. Vertical angles are opposite each other at one crossing, and opposite angles are equal. That makes the requested angle 100° .
13. Angles in a linear pair sit side by side on a straight line, so they total 180° . $180 - 95 = 85$, so the missing angle is 85° .
14. Alternate exterior angles are equal for parallel lines cut by a transversal. Since one exterior angle is 145° , the alternate exterior angle is 145° .
15. The problem asks for a corresponding angle, so look for the same position at the other crossing. Corresponding angles are equal, so the answer is 72° .
16. Same-side interior angles add to 180° . Subtract the known angle from 180 : $180 - 115 = 65$, so the other angle is 65° .
17. Alternate interior angles are equal when the lines are parallel. The matching angle is therefore 48° .
18. The angle next to a 130° angle forms a linear pair with it. Linear pairs add to 180° , so $180 - 130 = 50^\circ$.
19. The diagram marks corresponding angles, which means the two angles sit in matching positions at the two intersections. Matching positions have equal measures, so $x = 64^\circ$.
20. Same-side interior angles are the pair inside the parallel lines on the same side of the transversal. They must add to 180° , so $x = 180 - 112 = 68^\circ$.
21. These are alternate interior angles: inside the two lines, but on opposite sides of the transversal. Alternate interior angles are equal, so $x = 47^\circ$.
22. The two marked angles share a straight line, so they form a linear pair. A straight line is 180° , so $x = 180 - 138 = 42^\circ$.
23. The marked angles are vertical angles at the same intersection. Vertical angles are congruent, so $x = 76^\circ$.
24. The angles are outside the parallel lines and on opposite sides of the transversal, so they are alternate exterior angles. Alternate exterior angles are equal, giving $x = 121^\circ$.
25. Corresponding angles are equal, so set the expressions equal: $3x + 12 = 5x - 20$. Add 20 to both sides and subtract $3x$ from both sides to get $32 = 2x$, so $x = 16$.
26. Same-side interior angles are supplementary, so their expressions must add to 180° . Write $(4x + 8) + (2x + 40) = 180$, combine to get $6x + 48 = 180$, then solve $6x = 132$ and $x = 22$.
27. Alternate interior angles are equal, so set the two expressions equal: $6x - 5 = 4x + 17$. Subtract $4x$ and add 5 to get $2x = 22$, so $x = 11$.
28. The two marked angles are in corresponding positions. Corresponding angles are equal when the lines are parallel, so $x = 58^\circ$.
29. Same-side interior angles add to 180° , so write $(x + 35) + (2x + 70) = 180$. Combine like terms to get $3x + 105 = 180$, then $3x = 75$, so $x = 25$.
30. Angles A and B are both outside the parallel lines and on opposite sides of the transversal. That location makes them alternate exterior angles.



Keep Building HSPT Math Skills

Recommended Effortless Math resources



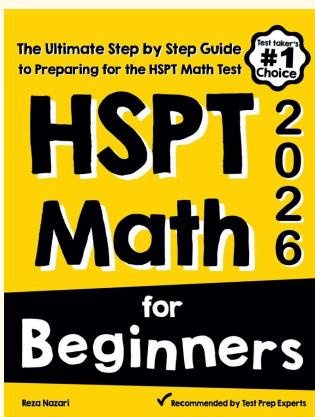
The Most Comprehensive HSPT Math Preparation Bundle

Use the complete HSPT Math resource for review, worked examples, extra practice, and test-style questions after each worksheet.



Scan Me
Download Instantly

STUDENT FAVORITE - HSPT Math for Beginners



HSPT Math for Beginners 2026

Step-by-step lessons, topic practice, and full review support for students who want a calm path through HSPT Math preparation.

A strong companion for self-study, tutoring, homework, and targeted review.

PDF Edition



Scan Me
Download Instantly

For more HSPT Math prep, visit EffortlessMath.com/HSPT