

Lines and Angles

Unit: Geometry and Triangles - Student Practice Worksheet

Overview: Kabir looked at two crossing lines and said all four angles at the crossing point must be equal, since they're 'at the same corner.' Zara measured one at 60° and the one right next to it at 120° . "Same corner," she said, "very different angles."

Practice Questions (30 Total)

Section A - Easy

Q1. Two lines cross. One wedge is 50° . What is the vertically opposite wedge?



- ☐ A. 130°
- ☐ B. 50°
- ☐ C. 90°
- ☐ D. 180°

Q2. What do the two angles in a linear pair sum to?

- ☐ A. 180°
- ☐ B. 90°
- ☐ C. 360°
- ☐ D. 270°

Q3. If two lines cross and one angle is 50° , what is its adjacent linear-pair angle?

- ☐ A. 50°
- ☐ B. 90°
- ☐ C. 130°
- ☐ D. 230°

Q4. Parallel lines, transversal. Co-interior 70° and x . Find x .



- ☐ A. 110°
- ☐ B. 70°
- ☐ C. 90°
- ☐ D. 180°

Q5. What is a transversal?

- ☐ A. A line parallel to another line
- ☐ B. An angle exactly 90°
- ☐ C. A line segment of fixed length
- ☐ D. A line that crosses two or more other lines

Q6. Co-interior angles formed by a transversal and two parallel lines sum to...

- ☐ A. 90°
- ☐ B. 180°
- ☐ C. 360°
- ☐ D. 270°

Q7. A transversal cuts two lines. How many angles are formed in total?



- ☐ A. 4
- ☐ B. 8
- ☐ C. 6
- ☐ D. 2

Q8. Do the transversal angle rules apply if the two lines are NOT parallel?

- ☐ A. Yes, always work
- ☐ B. Only for corresponding angles
- ☐ C. Only for co-interior angles
- ☐ D. No, they need parallel lines

Q9. Alternate interior angles formed by a transversal and two parallel lines are...

- ☐ A. Always supplementary
- ☐ B. Always 90°
- ☐ C. Always equal
- ☐ D. Always different

Q10. Corresponding angles with a transversal: when are they equal, and why?

- ☐ A. Always equal
- ☐ B. Always supplementary
- ☐ C. Always 90°
- ☐ D. Never related

Section B - Medium

Q11. Parallel lines, transversal. One angle 65° . Its corresponding angle?



- ☐ A. 65°
- ☐ B. 115°
- ☐ C. 25°
- ☐ D. 90°

Q12. If corresponding angles are equal, what can you conclude about alternate interior angles at the same transversal crossing?

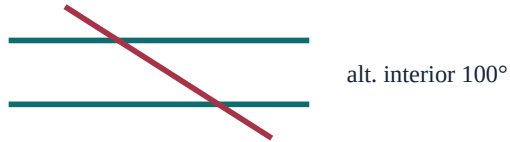
- ☐ A. They must be supplementary
- ☐ B. They must be equal too
- ☐ C. They must be 90°
- ☐ D. Nothing can be concluded

Q13. Two parallel lines are cut by a transversal. One angle is 65° . Find its co-interior angle.

- ☐ A. 65°
- ☐ B. 115°
- ☐ C. 25°

☐ D. 90°

Q14. Parallel lines. One interior angle 100° . Its alternate interior partner?



☐ A. 80°

☐ B. 90°

☐ C. 180°

☐ D. 100°

Q15. Two intersecting lines form four angles. If one angle is 90° , what are all four angles?

☐ A. $90^\circ, 90^\circ, 45^\circ, 135^\circ$

☐ B. All four are 90°

☐ C. $90^\circ, 180^\circ, 90^\circ, 0^\circ$

☐ D. Cannot be determined

Q16. Two lines cross, creating angles a, b, c, d in order around the point. If $a = 40^\circ$, find b, c, and d.

☐ A. $b=40^\circ, c=140^\circ, d=140^\circ$

☐ B. $b=140^\circ, c=140^\circ, d=40^\circ$

☐ C. $b=140^\circ, c=40^\circ, d=140^\circ$

☐ D. All equal 40°

Q17. Same crossing: $p = 55^\circ$. Vertically opposite angle at that point?



☐ A. 55°

☐ B. 125°

☐ C. 90°

☐ D. 35°

Q18. A transversal crosses two lines that are NOT parallel. One angle is 60° and its 'corresponding' position angle is 75° . What does this confirm?

- ☐ A. The lines are parallel
- ☐ B. Both angles must be wrong
- ☐ C. The lines are not parallel
- ☐ D. The transversal is not straight

Q19. Find the value of y if y and $3y$ form a linear pair.

- ☐ A. 60
- ☐ B. 90
- ☐ C. 30
- ☐ D. 45

Q20. Supplementary angles, one three times the other. Find the smaller, and why they sum to 180° .

- ☐ A. 45°
- ☐ B. 60°
- ☐ C. 30°
- ☐ D. 90°

Section C - Challenge

Q21. Corresponding: $3x+10$ and $5x-30$. Find x .

$$3x+10 = 5x-30 \quad \text{corresponding}$$

- ☐ A. 20
- ☐ B. 10
- ☐ C. 15
- ☐ D. 25

Q22. A transversal crosses two lines. If corresponding angles are equal AND co-interior angles are supplementary, what must be true?

- ☐ A. The transversal is perpendicular
- ☐ B. The two lines are parallel

- ☐ C. Both angles are 90°
- ☐ D. Nothing can be concluded

Q23. A transversal crosses two parallel lines. Co-interior angles are $(2x+20)^\circ$ and $(x+40)^\circ$. Find x .

- ☐ A. 30
- ☐ B. 40
- ☐ C. 50
- ☐ D. 60

Q24. Alternate interior: $3x-5$ and $2x+15$. Find x and the angle.

$$3x-5 = 2x+15 \quad \text{alt. interior}$$

- ☐ A. $x=15$, angle= 40°
- ☐ B. $x=10$, angle= 25°
- ☐ C. $x=25$, angle= 70°
- ☐ D. $x=20$, angle= 55°

Q25. A transversal crosses two lines, and you're told one pair of alternate interior angles are equal. Does this alone prove the two lines are parallel?

- ☐ A. Yes, equal alternate interior angles imply parallel lines
- ☐ B. No, you also need corresponding angles to be equal
- ☐ C. No, this can never determine parallelism
- ☐ D. Only if the transversal is perpendicular

Q26. Two lines intersect such that one angle is $(4x)^\circ$ and its linear pair partner is $(2x+30)^\circ$. Find both angles.

- ☐ A. 90° and 90°
- ☐ B. 120° and 60°
- ☐ C. 100° and 80°
- ☐ D. 110° and 70°

Q27. Eight angles from a transversal on parallels. Which pair is always supplementary?



- ☐ A. Any two corresponding angles
- ☐ B. Any two alternate interior angles
- ☐ C. Any two vertically opposite angles
- ☐ D. Any linear pair at either intersection

Q28. Two lines cross at a point, creating angle sum equations. If three of the four angles sum to 270° , what is the fourth angle?

- ☐ A. 270°
- ☐ B. 180°
- ☐ C. 90°
- ☐ D. 45°

Q29. Three parallel lines are all cut by the same transversal. If the angle at the first line is 50° , what is the corresponding angle at the third line?

- ☐ A. 100°
- ☐ B. 50°
- ☐ C. 130°
- ☐ D. Cannot be determined without more lines

Q30. One of eight angles is 72° . How many of the other seven equal 72° , and which kinds?

- ☐ A. 3
- ☐ B. 2
- ☐ C. 4
- ☐ D. 7

Answer Key

Q1: (B) (b) 50° . Vertically opposite angles are always exactly equal.

Q2: (A) (a) 180° . A linear pair always forms a straight line.

Q3: (C) (c) 130° . $180^\circ - 50^\circ = 130^\circ$, the linear pair partner.

Q4: (A) (a) 110° . $180^\circ - 70^\circ = 110^\circ$, since co-interior angles are supplementary.

Q5: (D) (d) A line that crosses two or more other lines. It's the third line cutting across the pair being studied.

Q6: (B) (b) 180° . Co-interior angles are supplementary when the lines are parallel.

Q7: (B) (b) 8. Each of the two intersections creates 4 angles, giving 8 total.

Q8: (D) (d) No, they require the lines to be parallel. Without parallel lines, corresponding and alternate angles are not guaranteed equal.

Q9: (C) (c) Always equal. Alternate interior angles sit on opposite sides of the transversal, between the two lines.

Q10: (A) (a) Always equal. Corresponding angles occupy the same relative position at each intersection.

Q11: (A) (a) 65° . Corresponding angles are always equal.

Q12: (B) (b) They must be equal too. Corresponding and alternate interior angles are linked through vertically opposite pairs, so both being equal happens together.

Q13: (B) (b) 115° . $180^\circ - 65^\circ = 115^\circ$, the co-interior supplement.

Q14: (D) (d) 100° . Alternate interior angles are always equal.

Q15: (B) (b) All four are 90° . If one angle is 90° , its linear pair is also 90° ($180-90$), and both vertically opposite angles equal 90° too.

Q16: (C) (c) $b=140^\circ$, $c=40^\circ$, $d=140^\circ$. b is adjacent (linear pair, $180-40=140$), c is vertically opposite to a (40), d is vertically opposite to b (140).

Q17: (A) (a) 55° . Vertically opposite angles at the same intersection are always equal, regardless of the transversal rules.

Q18: (C) (c) The lines are not parallel. If the lines were parallel, corresponding angles would have to be equal — since they differ, the lines are not parallel.

Q19: (D) (d) 45. $y+3y=180$, so $4y=180$, $y=45$.

Q20: (A) (a) 45° . Let smaller= x , larger= $3x$; $x+3x=180$, so $4x=180$, $x=45$.

Q21: (A) (a) 20. Corresponding angles are equal: $3x+10=5x-30$, so $40=2x$, $x=20$.

Q22: (B) (b) The two lines are parallel. These angle relationships are both a consequence of, and a test for, parallel lines — if either genuinely holds, the lines must be parallel.

Q23: (B) (b) 40. Co-interior angles sum to 180: $(2x+20)+(x+40)=180$, so $3x+60=180$, $3x=120$, $x=40$.

Q24: (D) (d) $x=20$, angle= 55° . Alternate interior angles are equal: $3x-5=2x+15$, so $x=20$, giving angle= $3(20)-5=55^\circ$.

Q25: (A) (a) Yes, equal alternate interior angles imply parallel lines. This is the converse of the alternate interior angles rule, used as a genuine test for parallelism.

Q26: (C) (c) 100° and 80° . $4x+2x+30=180$, so $6x=150$, $x=25$; angles are $4(25)=100^\circ$ and $2(25)+30=80^\circ$.

Q27: (D) (d) Any linear pair at either intersection. A linear pair sums to 180° by definition, unlike corresponding/alternate (equal) or vertically opposite (equal) pairs.

Q28: (C) (c) 90° . All four angles at any crossing sum to 360° , so the fourth is $360-270=90^\circ$.

Q29: (B) (b) 50° . Corresponding angles stay equal across every pair of parallel lines cut by the same transversal, no matter how many lines are involved.

Q30: (A) (a) 3. The vertically opposite angle at the same intersection, the corresponding angle, and its vertically opposite at the other intersection are all 72° — 3 others, with the remaining 4 being 108° ($180-72$).

You've got this! Keep learning and shining! - Ruchi Math Coaching