LESSON MAKER PRO

Angle Connections

Use parallel lines to find missing angles.

HIGH SCHOOL · G.2D.1.1

G.2D.1.1 "Use properties of parallel lines cut by a transversal to determine angle relationships and solve problems."

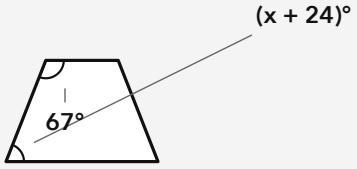
NAME _____ DATE _____

THE BIG IDEA

When parallel lines are cut by a transversal, corresponding angles are equal. Alternate interior and alternate exterior angles are also equal. Angles inside the parallel lines on the same side of the transversal add to 180°.

WORKED EXAMPLE

The bases of the trapezoid are parallel. Find x and the marked unknown angle.

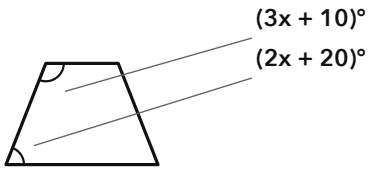


1. The marked angles are on the same side of a transversal, so 67 + (x + 24) = 180.
2. Combine terms: x + 91 = 180.
3. Solve: x = 89. Then x + 24 = 113.

Answer: x = 89; the angle is 113°

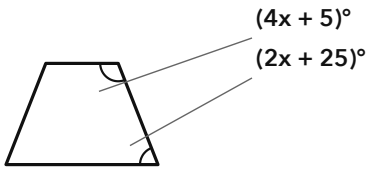
PRACTICE 6 problems

1 The bases of the trapezoid are parallel. Find x and both marked angles.



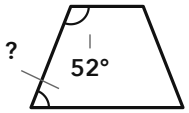
ANSWER _____

2 The bases of the trapezoid are parallel. Find x.



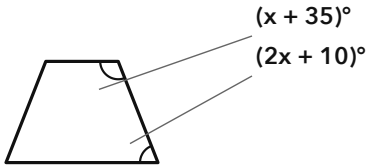
ANSWER _____

3 The bases of the trapezoid are parallel. Find the angle marked ?.



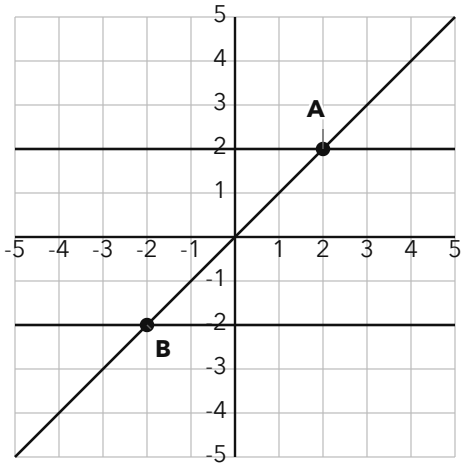
ANSWER _____

4 The bases of the trapezoid are parallel. Find x and both marked angles.



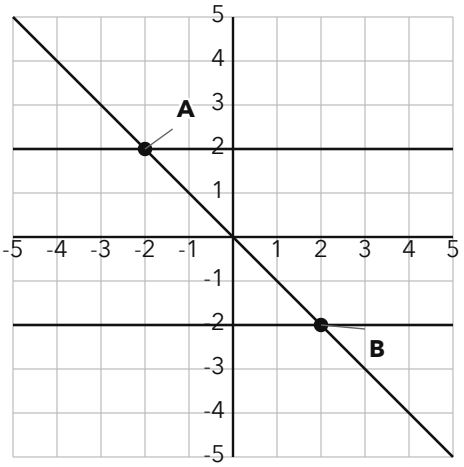
ANSWER _____

5 The two horizontal lines are parallel. The upper-right angle at A is (2x + 5)°. The upper-right angle at B is 45°. Find x.



ANSWER _____

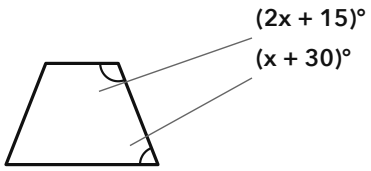
6 The two horizontal lines are parallel. The upper-right angle at A is (x + 55)°. The lower-left angle at B is (2x - 25)°. Find x.



ANSWER _____

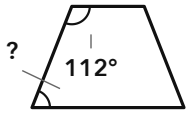
APPLY IT Show your work

1 A skatepark ramp has parallel top and bottom edges. Its slanted side joins those edges. Use the marked corner angles to find x and the larger angle.



ANSWER _____

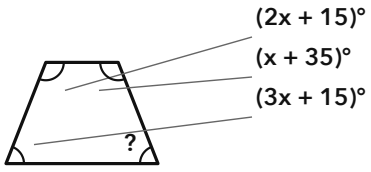
2 A concert sign has parallel top and bottom edges. A slanted edge connects them. What is the corner angle marked ? in the frame design?



ANSWER _____

CHALLENGE One step up

The bases of the trapezoid are parallel. Find x and the angle marked ?. Explain which angle relationship you use on each side.



WORK SPACE AND ANSWER

ANSWER KEY

Angle Connections

HIGH SCHOOL · G.2D.1.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The bases of the trapezoid are parallel. Find x and both marked angles.	**x = 30; the angles are 100° and 80°**
2	The bases of the trapezoid are parallel. Find x.	**x = 25**
3	The bases of the trapezoid are parallel. Find the angle marked ?.	**128°**
4	The bases of the trapezoid are parallel. Find x and both marked angles.	**x = 45; the angles are 80° and 100°**
5	The two horizontal lines are parallel. The upper-right angle at A is (2x + 5)°. The upper-right angle at B is 45°. Find x.	**x = 20**
6	The two horizontal lines are parallel. The upper-right angle at A is (x + 55)°. The lower-left angle at B is (2x - 25)°. Find x.	**x = 80**

PART 2 · APPLY IT

1. **x = 45; the larger angle is 105°** The marked angles add to 180°, so (2x + 15) + (x + 30) = 180 and x = 45. The larger angle is 2(45) + 15 = 105°.
2. **68°** The two angles along the slanted edge add to 180°, so the missing angle is 180° - 112° = 68°.

CHALLENGE

x = 30; ? = 115°. The two angles on the left leg add to 180°, giving (2x + 15) + (3x + 15) = 180. The two angles on the right leg also add to 180°, so ? = 180° - (30 + 35)° = 115°.

Accept equations or verbal explanations that correctly identify same-side interior angles as supplementary. In Problems 5 and 6, accept corresponding and alternate exterior angles, respectively, as the equal-angle relationships.