

Unit 2: Congruence

ADVANCED · SET 2

Name: _____ Date: _____

Show all work. Give each answer as a single exact value (number, fraction, coordinate pair, ratio, or short word). Assume standard congruence and rigid-transformation rules.

1. Triangle ABC is congruent to triangle DEF. In triangle ABC, angle A = $(3x + 14)^\circ$ and its corresponding angle D = $(5x - 26)^\circ$. Find the value of x.

Answer: _____

2. Triangle PQR is congruent to triangle STU. Side PQ = $4y - 7$ and its corresponding side ST = $2y + 11$. Also side QR = $3y$. Find the length of QR.

Answer: _____

3. A rigid transformation maps point A(-6, 5) to A'(2, -3). The same translation maps point B(4, -1). Find the coordinates of B'.

Answer: _____

4. Point P(7, -2) is reflected across the y-axis, then the image is reflected across the x-axis. Find the coordinates of the final image point.

Answer: _____

5. Point M(-3, 8) is rotated 90° counterclockwise about the origin, then translated by (5, -4). Find the coordinates of the final image.

Answer: _____

6. Triangle ABC is congruent to triangle XYZ. The angles of triangle ABC are angle A = $(2x + 10)^\circ$, angle B = $(x + 25)^\circ$, and angle C = $(3x - 5)^\circ$. Find the measure of angle B in degrees.

Answer: _____

7. In two congruent triangles, a pair of corresponding sides are given by $5a - 12$ and $2a + 18$. Find the common length of that side.

Answer: _____

8. Point (10, -6) is rotated 180° about the origin, then reflected across the line $y = x$. Find the coordinates of the final image.

Answer: _____

9. Triangle ABC is congruent to triangle DEF by SAS, using $AB = DE$, angle A = angle D, and $AC = DF$. Given $AB = 3x + 5$, $DE = 5x - 9$, and $AC = 2x + 4$, find the length of DF.

Answer: _____

10. A translation maps (x, y) to $(x - 3, y + 7)$. Under this translation, the image of a point is (10, -2). Find the coordinates of the original point.

Answer: _____

11. Triangle ABC is congruent to triangle DEF. The perimeter of triangle DEF is 84. In triangle ABC, $AB = 2x + 3$, $BC = 4x - 1$, and $CA = 3x + 10$. Find the value of x .

Answer: _____

12. Point $A(2, 3)$ is reflected across the line $x = 6$ to give A' , then A' is reflected across the line $x = 10$ to give A'' . This composition equals a single translation. Find the horizontal distance (a positive number) from A to A'' .

Answer: _____