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Date: _____

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STATION 1: TRIANGLE SIMILARITY

1. A triangle has sides whose lengths are 5, 12, and 13. A similar triangle could have sides with lengths of

- 1) 3, 4, and 5
- 2) 6, 8, and 10
- 3) 7, 24, and 25

④ 10, 24, and 26 (scale factor of 2)

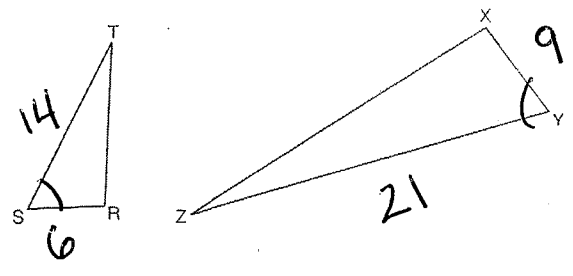
2. The sides of a triangle measure 7, 4, and 9. If the longest side of a similar triangle measures 36, determine and state the length of the shortest side of this triangle.

$$\frac{9}{36} = \frac{4}{x}$$

$$9x = 144$$

$$x = 16$$

3. Triangles *RST* and *XYZ* are drawn below. If $RS = 6$, $ST = 14$, $XY = 9$, $YZ = 21$, and $\angle S \cong \angle Y$, is $\triangle RST$ similar to $\triangle XYZ$? Justify your answer.

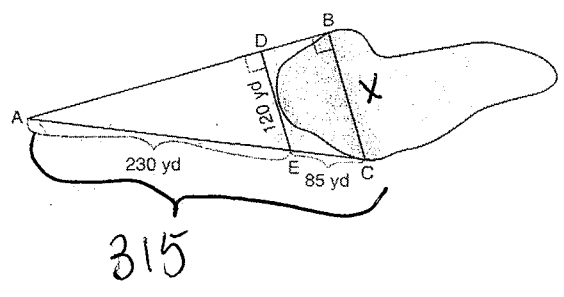


$$\frac{6}{9} = \frac{2}{3} \checkmark$$

$$\frac{14}{21} = \frac{2}{3} \checkmark$$

yes, $\triangle RST \sim \triangle XYZ$
by SAS \sim

4. To find the distance across a pond from point *B* to point *C*, a surveyor drew the diagram below. The measurements he made are indicated on his diagram. Use the surveyor's information to determine and state the distance from point *B* to point *C*, to the nearest yard.



$$\frac{x}{120} = \frac{315}{230}$$

$$230x = 37800$$

$$x = 164.3$$

$$x = 164$$

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STATION 2: AREA AND PERIMETER SIMILARITY

1. Which is *not* a property of all similar triangles?

1) The corresponding angles are congruent. ✓

2) The corresponding sides are congruent. **NO!**

3) The perimeters are in the same ratio as the corresponding sides. ✓

4) The altitudes are in the same ratio as the corresponding sides. ✓

2. In the diagram below, $\triangle ABC \sim \triangle DEC$. If $AC = 12$, $DC = 7$, $DE = 5$, and the perimeter of $\triangle ABC$ is 30, what is the perimeter of $\triangle DEC$?

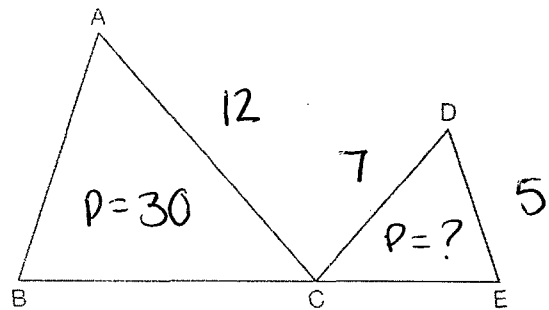
1) 12.5

2) 14.0

3) 14.8

4) 17.5

$$\frac{30}{x} = \frac{12}{7}$$
$$12x = 210$$
$$x = 17.5$$



3. Two triangles are similar. The lengths of the sides of the smaller triangle are 3, 5, and 6, and the length of the longest side of the larger triangle is 18. What is the perimeter of the larger triangle?

1) 14

2) 18

3) 24

4) 42

$$\text{perimeter (small)} = 3 + 5 + 6 = 14$$

$$\frac{\text{(small)}}{\text{(big)}} \frac{14}{x} = \frac{6}{18}$$

$$252 = 60x$$

$$x = 42$$

4. Delroy's sailboat has two sails that are similar triangles. The larger sail has sides of 10 feet, 24 feet, and 26 feet. If the shortest side of the smaller sail measures 6 feet, what is the perimeter of the *smaller* sail?

1) 15 ft

2) 36 ft

3) 60 ft

4) 100 ft

$$\text{perimeter (big)} = 10 + 24 + 26 = 60$$

$$\frac{\text{(small)}}{\text{(big)}} = \frac{x}{60} = \frac{6}{10}$$

$$360 = 10x$$

$$x = 36$$

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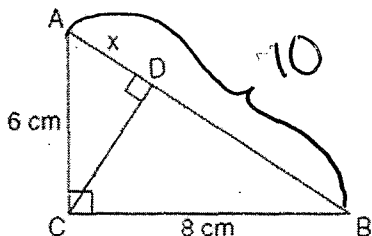
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STATION 3: RIGHT TRIANGLE SIMILARITY (HLLS)

1. In the diagram below, the length of the legs \overline{AC} and \overline{BC} of right triangle ABC are 6 cm and 8 cm, respectively. Altitude \overline{CD} is drawn to the hypotenuse of $\triangle ABC$.

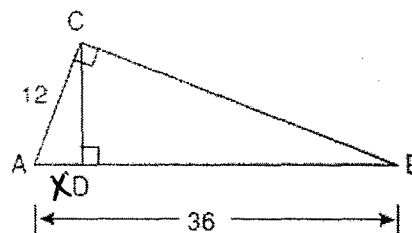


What is the length of \overline{AD} to the nearest tenth of a centimeter?

- 1) 3.6
- 2) 6.0
- 3) 6.4
- 4) 4.0

Need Hypotenuse ↑
 $6^2 + 8^2 = x^2$
 $100 = x^2$
 $x = 10$
 $\frac{10}{6} = \frac{6}{x}$ $30 = 10x$
 $x = 3.6$

2. In the diagram below of right triangle ACB , altitude \overline{CD} is drawn to hypotenuse \overline{AB} .

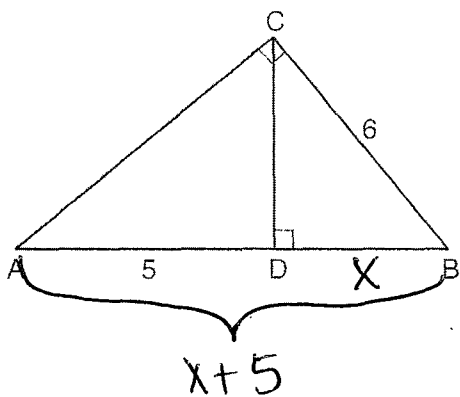


If $AB = 36$ and $AC = 12$, what is the length of \overline{AD} ?

- 1) 32
- 2) 6
- 3) 3
- 4) 4

$\frac{36}{12} = \frac{12}{x}$
 $144 = 36x$
 $x = 4$

3. In the diagram below of right triangle ABC , \overline{CD} is the altitude to hypotenuse \overline{AB} , $CB = 6$, and $AD = 5$.

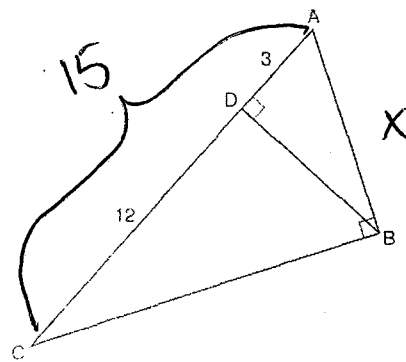


What is the length of \overline{BD} ?

- 1) 5
- 2) 9
- 3) 3
- 4) 4

$\frac{x+5}{6} = \frac{6}{x}$
 $x^2 + 5x = 36$
 $x^2 + 5x - 36 = 0$
 $(x+9)(x-4) = 0$
 Reject $x = -9$
 $x = 4$

4. In right triangle ABC shown in the diagram below, altitude \overline{BD} is drawn to hypotenuse \overline{AC} , $CD = 12$, and $AD = 3$.



What is the length of \overline{AB} ?

- 1) $5\sqrt{3}$
- 2) 6
- 3) $3\sqrt{5}$
- 4) 9

$\frac{15}{x} = \frac{x}{3}$
 $\sqrt{x^2} = \sqrt{45}$
 $x = \sqrt{9} \sqrt{5}$
 $x = 3\sqrt{5}$

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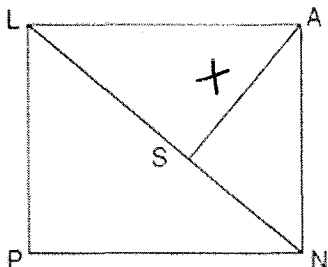
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STATION 4: RIGHT TRIANGLE SIMILARITY (SAAS)

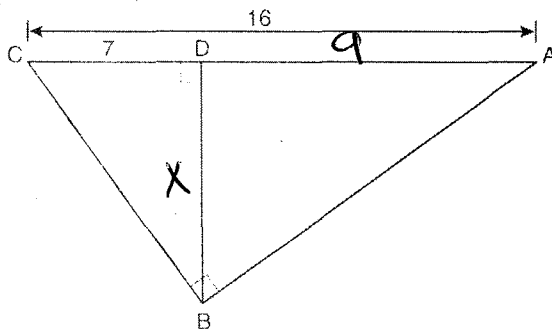
1. The accompanying diagram shows part of the architectural plans for a structural support of a building. $PLAN$ is a rectangle and $AS \perp LN$.



Which equation can be used to find the length of AS ?

- 1) $\frac{LS}{AS} = \frac{AS}{SN}$ alt. must be diagonal
- 2) $\frac{AN}{LN} = \frac{AS}{LS}$
- 3) $\frac{AS}{SN} = \frac{AS}{LS}$
- 4) $\frac{AS}{LS} = \frac{LS}{SN}$

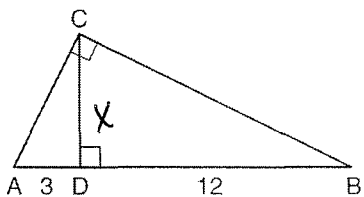
2. In the diagram below of right triangle ABC , altitude BD is drawn to hypotenuse AC , $AC = 16$, and $CD = 7$.



What is the length of BD ?

- 1) $3\sqrt{7}$
- 2) $4\sqrt{7}$
- 3) $7\sqrt{3}$
- 4) 12
- $\frac{7}{x} = \frac{x}{9}$
 $\sqrt{x^2} = \sqrt{63}$
 $x = \sqrt{9 \cdot 7}$
 $x = 3\sqrt{7}$

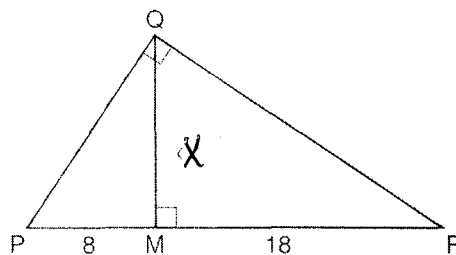
3. In the diagram below of right triangle ABC , altitude CD is drawn to hypotenuse AB .



If $AD = 3$ and $DB = 12$, what is the length of altitude CD ?

- 1) 6
- 2) $6\sqrt{5}$
- 3) 3
- 4) $3\sqrt{5}$
- $\frac{3}{x} = \frac{x}{12}$
 $\sqrt{x^2} = \sqrt{36}$
 $x = 6$

4. In the diagram below, QM is an altitude of right triangle PQR , $PM = 8$, and $RM = 18$.



What is the length of QM ?

- 1) 20
- 2) 16
- 3) 12
- 4) 10
- $\frac{8}{x} = \frac{x}{18}$
 $\sqrt{x^2} = \sqrt{144}$
 $x = 12$