G.G.45: Similarity 2: Investigate, justify, and apply theorems about similar triangles

1 The perimeter of $\triangle A'B'C'$, the image of $\triangle ABC$, is twice as large as the perimeter of $\triangle ABC$. What type of transformation has taken place?
1) dilation
2) translation
3) rotation
4) reflection

2 The sides of a triangle are 8, 12, and 15. The longest side of a similar triangle is 18. What is the ratio of the perimeter of the smaller triangle to the perimeter of the larger triangle?
1) 2:3
2) 4:9
3) 5:6
4) 25:36

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

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

5 The base of an isosceles triangle is 5 and its perimeter is 11. The base of a similar isosceles triangle is 10. What is the perimeter of the larger triangle?
1) 15
2) 21
3) 22
4) 110

6 Triangle *ABC* is similar to triangle *DEF*. The lengths of the sides of $\triangle ABC$ are 5, 8, and 11. What is the length of the shortest side of $\triangle DEF$ if its perimeter is 60?
1) 10
2) 12.5
3) 20
4) 27.5

7 On a scale drawing of a new school playground, a triangular area has sides with lengths of 8 centimeters, 15 centimeters, and 17 centimeters. If the triangular area located on the playground has a perimeter of 120 meters, what is the length of its longest side?
1) 24 m
2) 40 m
3) 45 m
4) 51 m

8 The corresponding medians of two similar triangles are 8 and 20. If the perimeter of the larger triangle is 45, what is the perimeter of the *smaller* triangle?
1) 14
2) 18
3) 33
4) 37

9 Two triangles are similar, and the ratio of each pair of corresponding sides is $2:1$. Which statement regarding the two triangles is *not* true?
1) Their areas have a ratio of $4:1$.
2) Their altitudes have a ratio of $2:1$.
3) Their perimeters have a ratio of $2:1$.
4) Their corresponding angles have a ratio of $2:1$.

10 $\triangle ABC$ is similar to $\triangle DEF$. The ratio of the length of $\overline{AB}$ to the length of $\overline{DE}$ is $3:1$. Which ratio is also equal to $3:1$?
1) $\frac{\text{m}\angle A}{\text{m}\angle D}$
2) $\frac{\text{m}\angle B}{\text{m}\angle F}$
3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}$
4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}$

11 Given $\triangle ABC \sim \triangle DEF$ such that $\frac{AB}{DE} = \frac{3}{2}$. Which statement is *not* true?
1) $\frac{BC}{EF} = \frac{3}{2}$
2) $\frac{\text{m}\angle A}{\text{m}\angle D} = \frac{3}{2}$
3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF} = \frac{9}{4}$
4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF} = \frac{3}{2}$

12 Which is *not* a property of all similar triangles?
1) The corresponding angles are congruent.
2) The corresponding sides are congruent.
3) The perimeters are in the same ratio as the corresponding sides.
4) The altitudes are in the same ratio as the corresponding sides.

13 If $\triangle ABC \sim \triangle LMN$, which statement is *not* always true?
1) $\text{m}\angle A \cong \text{m}\angle N$
2) $\text{m}\angle B \cong \text{m}\angle M$
3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle LMN} = \frac{(AC)^2}{(LN)^2}$
4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle LMN} = \frac{AB}{LM}$

14 Triangle RST is similar to $\triangle XYZ$ with $RS = 3$ inches and $XY = 2$ inches. If the area of $\triangle RST$ is 27 square inches, determine and state the area of $\triangle XYZ$, in square inches.

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Answer Section

1 ANS: 1 REF: 010505a

2 ANS: 3

$$\frac{15}{18} = \frac{5}{6}$$

REF: 081317ge

3 ANS: 4 REF: 060208a

4 ANS: 2 REF: 060411a

5 ANS: 3 REF: 010704a

6 ANS: 2

Perimeter of $\triangle DEF$ is $5 + 8 + 11 = 24$. $\frac{5}{24} = \frac{x}{60}$

$$24x = 300$$

$$x = 12.5$$

REF: 011307ge

7 ANS: 4 REF: 060524a

8 ANS: 2

$$45 \cdot \frac{8}{20} = 18$$

REF: 081511ge

9 ANS: 4 REF: fall0826ge

10 ANS: 4 REF: 081023ge

11 ANS: 2 REF: 011022ge

12 ANS: 2 REF: 080729a

13 ANS: 1 REF: 061517ge

14 ANS:

$$\left(\frac{3}{2}\right)^2 = \frac{27}{A}$$

$$\frac{9}{4} = \frac{27}{A}$$

$$9A = 108$$

$$A = 12$$

REF: 061434ge