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Date _____
Geometry

Scale Factor with Perimeter and Area

1. The scale factor of a triangle dilation is 3. What is the scale factor of their:
   a) perimeters 3
   b) areas $3^2=9$
   c) angles 1

2. The ratio of the sides of similar triangles is 5:1. What is the ratio of their:
   a) perimeters 5:1
   b) areas $5^2:1^2=25:1$
   c) angles 1:1

3. The scale factor of a triangle dilation is $\frac{1}{2}$. What is the scale factor of their:
   a) perimeters $\frac{1}{2}$
   b) areas $\left(\frac{1}{2}\right)^2=\frac{1}{4}$
   c) angles 1

4. The ratio of the sides of similar triangles is 4:3. What is the ratio of their:
   a) perimeters 4:3
   b) areas $4^2:3^2=16:9$
   c) angles 1:1

5. 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. $2^2:1^2=4:1$ ✓
   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. ✗ 1:1

6. 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) $\frac{m\angle A}{m\angle D}=\frac{3}{2}$ ✗ $\frac{1}{1}$
   3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}=\frac{9}{4}$ $\left(\frac{3}{2}\right)^2=\frac{9}{4}$ ✓
   4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}=\frac{3}{2}$ ✓

7. $\triangle ABC$ 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) $\frac{m\angle A}{m\angle D}$ 1:1
   (2) $\frac{m\angle B}{m\angle F}$ 1:1
   (3) $\frac{\text{area of } \triangle ABC}{\text{area of } \triangle DEF}$ $3^2:1^2$ 9:1
   (4) $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}$ 3:1 ✓

8. Triangle JOY has a perimeter of 10 and an area of 12. What is the perimeter and area of triangle JOY after a dilation by a scale factor of 2?

$P = 10(2) = 20$
$A = 12(2)^2 = 48$

9. Quadrilateral CAMI has a perimeter of 20 and an area of 15. What is the perimeter and area of quadrilateral CAMI after a dilation by a scale factor of 4?

$P = 20(4) = 80$
$A = 15(4)^2 = 240$

10. Triangle *RJM* has an area of 6 and a perimeter of 12. If the triangle is dilated by a scale factor of 3 centered at the origin, what are the area and perimeter of its image, triangle *R'J'M'*?

1) area of 9 and perimeter of 15
2) area of 18 and perimeter of 36
3) area of 54 and perimeter of 36
4) area of 54 and perimeter of 108

$P = 12(3) = 36$
$A = 6(3)^2 = 54$

11. Rectangle *A'B'C'D'* is the image of rectangle *ABCD* after a dilation centered at point *A* by a scale factor of $\frac{2}{3}$. Which statement is correct?

1) Rectangle *A'B'C'D'* has a perimeter that is $\frac{2}{3}$ the perimeter of rectangle *ABCD*.
2) Rectangle *A'B'C'D'* has a perimeter that is $\frac{3}{2}$ the perimeter of rectangle *ABCD*.
3) Rectangle *A'B'C'D'* has an area that is $\frac{2}{3}$ the area of rectangle *ABCD*.
4) Rectangle *A'B'C'D'* has an area that is $\frac{3}{2}$ the area of rectangle *ABCD*.

12. A triangle is dilated by a scale factor of 3 with the center of dilation at the origin. Which statement is true?

1) The area of the image is nine times the area of the original triangle. $3^2 = 9$
2) The perimeter of the image is nine times the perimeter of the original triangle.
3) The slope of any side of the image is three times the slope of the corresponding side of the original triangle.
4) The measure of each angle in the image is three times the measure of the corresponding angle of the original triangle.