

NAME: \_\_\_\_\_

1. The area of a regular octagon is  $45 \text{ cm}^2$ .  
What is the area of a regular octagon with  
sides six times as large?

[A]  $1685 \text{ cm}^2$       [B]  $270 \text{ cm}^2$   
[C]  $1620 \text{ cm}^2$       [D]  $12150 \text{ cm}^2$

2. The area of a regular octagon is  $35 \text{ cm}^2$ .  
What is the area of a regular octagon with  
sides five times as large?

[A]  $875 \text{ cm}^2$       [B]  $810 \text{ cm}^2$   
[C]  $6125 \text{ cm}^2$       [D]  $175 \text{ cm}^2$

3. Two 8-sided polygons are similar. A side of  
the larger polygon is 5 times as long as the  
corresponding side of the smaller polygon.  
What is the ratio of the area of the larger  
polygon to the area of the smaller polygon?

4. Two 6-sided polygons are similar. A side of  
the larger polygon is 5 times as long as the  
corresponding side of the smaller polygon.  
What is the ratio of the area of the larger  
polygon to the area of the smaller polygon?

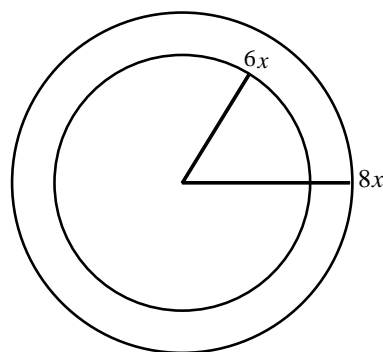
5. The areas of two similar triangles are  $16 \text{ cm}^2$   
and  $25 \text{ cm}^2$ . What is the ratio of the  
corresponding side lengths? of the  
perimeters?

6. The widths of two similar rectangles are 3 cm  
and 20 cm. What is the ratio of the  
perimeters? of the areas?

7. Two trapezoids have areas  $847 \text{ cm}^2$  and  
 $700 \text{ cm}^2$ . Find their ratio of similarity.

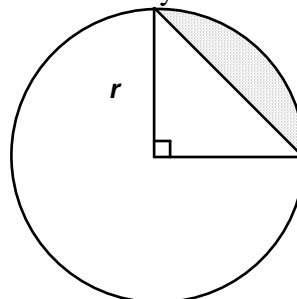
8. Two trapezoids have areas  $125 \text{ cm}^2$  and  
 $20 \text{ cm}^2$ . Find their ratio of similarity.

9. Find the ratios of the circumferences and of  
the areas of the small circle to the larger one.



[A]  $4 : 3$ ;  $16 : 9$       [B]  $3x : 4x$ ;  $6x : 8x$   
[C]  $3x : 4x$ ;  $9x : 16x$       [D]  $3 : 4$ ;  $9 : 16$

10. Use your calculator or computer to find the  
area (in terms of  $\pi$ ) for the shaded region  
when  $r = 1, 2, 3$ , and  $4$ . Then hypothesize  
what will happen to the area if you multiply  
the radius by a factor of  $n$ .



[1] C

[2] A

[3]  $\frac{25}{1}$

[4]  $\frac{25}{1}$

[5] 4:5; 4:5

[6] 3:20; 9:400

[7] 11 : 10

[8] 5 : 2

[9] D

[10]  $\frac{\pi}{4} - \frac{1}{2}; \pi - 2; \frac{9\pi}{4} - \frac{9}{2}; 4\pi - 8$ . The area  
will be multiplied by a factor of  $n^2$ .