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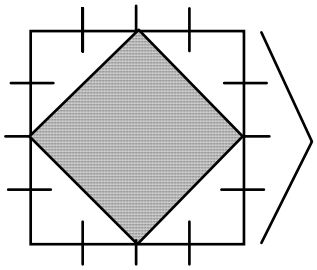
P.I. G.G.39: Investigate, justify, and apply theorems about special parallelograms (squares) involving their angles, sides, and diagonals

1. The perimeter of a square is 64 meters. Find the area of the square.

2. Use the figure below. What is the area of the shaded square?



[A] 100 cm^2 [B] 200 cm^2

[C] 50 cm^2 [D] 400 cm^2

3. A frame shop wants to cut a square hole in a mat 16 in. by 7 in. If each side of the hole is x in., which equation represents the remaining area?

[A] $a = -x^2 + 46$ [B] $a = -x^2 + 112$

[C] $a = x^2 + 112$ [D] $a = x^2 + 16$

4. The formula for the area of a square is $A = s^2$. Write an expression for the area of a square in which $s = 4x^4$.

5. The area of a square is 200 cm^2. How long is the diagonal?

[A] 141.4 cm [B] 20 cm

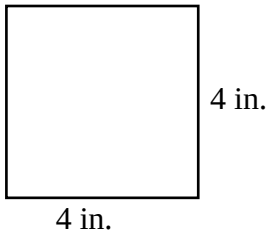
[C] 28.2 cm [D] 14.1 cm

[E] none of the above

6. A solar energy collector needs several 3 in. by 3 in. square panels to cover an area 14 ft by 6 ft. How many of the square panels are needed?

[A] 112 [B] 1344 [C] 756 [D] 4032

7. The sides of a square are each decreased by 2 inches. The area of the new square is 25 square inches. Find the length of a side of the original square.

8. 

Use the figure above. How does the figure's area change when the length is increased by one inch and the width is decreased by one inch?

[A] no change [B] increases

[C] cannot tell [D] decreases

NAME:_____

9. Compare the quantity in Column A with the quantity in Column B.

Column A	Column B
perimeter of a square with area 64 cm^2	perimeter of a rectangle that is not a square with area 64 cm^2

[A] The quantity in Column A is greater. [B] The quantity in Column B is greater.

[C] The two quantities are equal.

[D] The relationship cannot be determined on the basis of the information supplied.

10. The base of the Great Pyramid in Egypt is a square whose sides measure about 752 ft. Estimate the area in acres of the base of the Great Pyramid to the nearest hundredth. (Hint: 1 acre = 43,560 ft^2.)

[A] 12.90 acres [B] 12.8 acres [C] 12.98 acres [D] 13.00 acres

11. Brigid hired a tile setter to tile her bathroom floor. The tile setter charged Brigid $1.50 per tile to install the tiles. Each tile is four inches square, and Brigid's bathroom floor has an area of 75 square feet. If the total bill is $1000, was Brigid overcharged?

12. Graph *ABCD* and find its area: $A(-2, -1)$, $B(1, 3)$, $C(5, 0)$, and $D(2, -4)$.

[1] $256\ m^2$

[2] B

[3] B

[4] $16x^8$

[5] B

[6] B

[7] 7 inches

[8] D

[9] B

[10] C

[11] No. There are 9 tile per square foot; $9 \cdot 75 \cdot 1.50 = \$1012.50$.

[12] 25 square units