

4.9

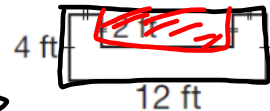
Area of Composite Shapes

Try These

Is the area of this shape more than or less than 48 sq ft?

Explain your thinking. less

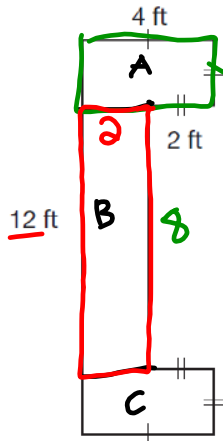
cut out some area so must be less



$$12 \times 4 = 48$$

Danielle wants to use paving stones to pave a rectangular loading area outside her store's entrance. Paving stones are about \$8.50/sq ft. How much should she expect to pay?

1 How can you divide the shape into areas you can calculate?



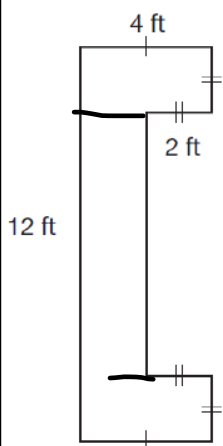
2 What is the area of each part?

Area A: $\frac{4\text{ ft} \times 2\text{ ft}}{=} = 8$ sq ft

Area B: $\frac{8\text{ ft} \times 2\text{ ft}}{=} = 16$ sq ft

Area C: $\frac{4\text{ ft} \times 2\text{ ft}}{=} = 8$ sq ft

Danielle wants to use paving stones to pave a rectangular loading area outside her store's entrance. Paving stones are about \$8.50/sq ft. How much should she expect to pay?



3 What is the total area of the loading area?

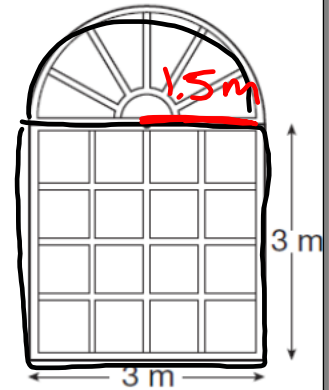
$\underline{8}$ sq ft + 16 sq ft + $\underline{8}$ sq ft = 32 sq ft

4 What is the cost for paving stones?

$32 \times 8.50 = \$272$

Example 1

Liam is a window installer. A Norman window has this shape. What is the area of the window?



Solution

Total area = area of square + area of semicircle

Area of square: $(\underline{3} \text{ m})^2 = \underline{9} \text{ m}^2$

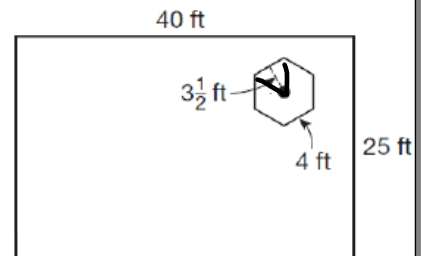
Area of semicircle = $(\underline{\pi \times r^2}) \div 2$

$(\underline{\pi \times 1.5^2}) \div 2 \doteq \underline{3.5} \text{ m}^2$

The area of the window is $\underline{9} \text{ m}^2 + \underline{3.5} \text{ m}^2 = \underline{12.5} \text{ m}^2$

Example 2

Angie is re-shingling a roof with two sides. Each side is rectangular with a skylight in the shape of a regular hexagon as shown. One bundle of shingles covers 2.25 m^2 . How many bundles of shingles are needed?



Solution

A. What is the area to be shingled?

Area of shingles = area of rectangles - area of skylights

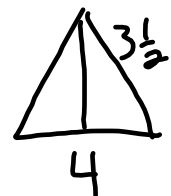
Area of rectangles: $\underline{40} \text{ ft} \times \underline{25} \text{ ft} \times 2 = \underline{2000} \text{ sq ft}$

Area of skylights (2 regular hexagons)

= $[\underline{6} \times \text{area of triangles}] \times 2$

= $[\underline{6} \times (\underline{3.5 \times 4 \div 2})] \times 2$

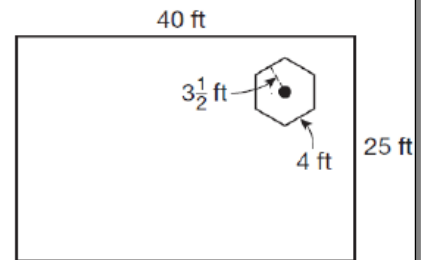
= $\underline{84} \text{ sq ft}$



Area $2000 \text{ sq ft} - 84 \text{ sq ft}$
 $= 1916 \text{ sq ft}$

Example 2

Angie is re-shingling a roof with two sides. Each side is rectangular with a skylight in the shape of a regular hexagon as shown. One bundle of shingles covers 2.25 m^2 . How many bundles of shingles are needed?



B. How many bundles of shingles are needed?

1 bundle covers 2.25 m^2 , and $1 \text{ m}^2 \doteq 10.76 \text{ sq ft}$, so

$$\frac{2.25}{1916} \text{ m}^2 \times \frac{10.76}{24.2} \text{ sq ft/m}^2 \text{ covers about } \frac{24.2}{79} \text{ sq ft}$$

$$\frac{1916}{24.2} \text{ sq ft} \div \frac{24.2}{79} \text{ sq ft} \doteq 79$$

79 bundles ≈ 80