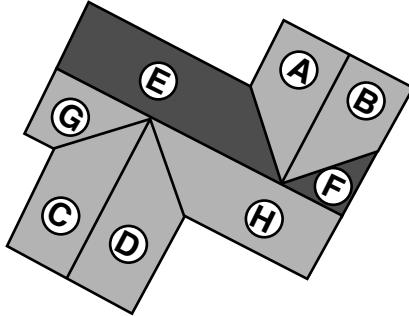
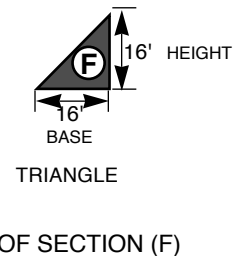
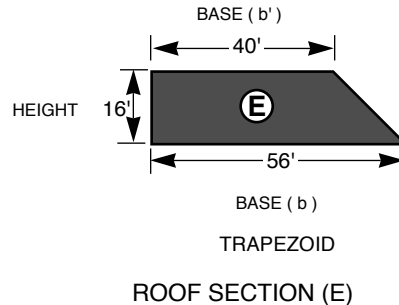


DIRECTIONS FOR ESTIMATING ROOF COST

The customer wants you to estimate the cost of building a shingle roof for a new tract of homes being built in your city. Your job is to estimate the cost of two roof sections (E) and (F). See plans below for dimensions.

OVERALL ROOF PLAN
(VIEW FROM ABOVE)

ROOF SECTIONS (E) and (F)



YOU NEED TO FIGURE

You need to find the area of two roof sections (E) and (F) in order to calculate the cost of applying shingles. Look at the drawings above. One roof section is a triangular shape and the other roof is a trapezoid.

First find the AREA OF THE TRAPEZOID (ROOF SECTION (E)). A trapezoid is a four-sided figure. Two of the trapezoid sides, called bases, are parallel. To find the area of a trapezoid multiply one half the sum of the bases by the height. $A = 1/2 \times (b + b') \times h$

STEP 1: Add together the parallel bases.

$$\text{Add } \frac{56}{\text{BASE (b)}} \text{ ft.} + \frac{40}{\text{BASE (b')}} \text{ ft.} = \frac{96}{\text{SUM OF THE BASES}} \text{ ft.}$$

STEP 2: Multiply $1/2 \times \frac{96}{\text{SUM OF THE BASES}} \text{ ft.} = \frac{48}{1/2 \text{ SUM OF THE BASES}} \text{ ft.}$

STEP 3: Multiply $\frac{48}{1/2 \text{ SUM OF THE BASES}} \text{ ft.} \times \frac{16}{\text{HEIGHT}} \text{ ft.} = \frac{768}{\text{AREA OF ROOF SECTION (E)}} \text{ sq. ft.}$

STEP 4: FIND THE AREA OF THE TRIANGULAR ROOF: (ROOF SECTION (F))

To find the area of a triangle, multiply $1/2$ times base times the height. ($A = 1/2 \times b \times h$)

$$\text{Multiply } 1/2 \times \frac{16}{\text{BASE}} \text{ ft.} = \frac{8}{1/2 \text{ OF THE BASE}} \text{ ft.}$$

$$\text{Multiply } \frac{8}{1/2 \text{ OF THE BASE}} \text{ ft.} \times \frac{16}{\text{HEIGHT}} \text{ ft.} = \frac{128}{\text{AREA OF ROOF SECTION (F)}} \text{ sq.ft.}$$

STEP 5: Add the areas of the two roofs together to find total roof area.

$$\text{Add } \frac{768}{\text{AREA OF ROOF (E)}} \text{ sq. ft.} + \frac{128}{\text{AREA OF ROOF (F)}} \text{ sq. ft.} = \frac{896}{\text{TOTAL AREA OF ROOF SECTIONS (E) AND (F)}} \text{ sq. ft.}$$

STEP 6: The fiberglass shingles, felt, and nails to cover this roof will cost \$0.41 per square foot. The labor to have a roofing crew install the shingles will cost \$0.29 per square foot. Your combined labor and materials will cost you \$0.70 per square foot of roof. To find your cost, multiply the number of square feet of roof times \$0.70:

$$\text{Multiply } \frac{896}{\text{TOTAL AREA OF ROOF SECTIONS (E) AND (F)}} \text{ sq. ft.} \times \$ \frac{0.70}{\text{COST PER SQUARE FOOT}} = \$ \frac{627.20}{\text{COST OF ROOF SECTIONS (E) AND (F)}}$$

FIGURED BY:

FIGURES CHECKED BY: