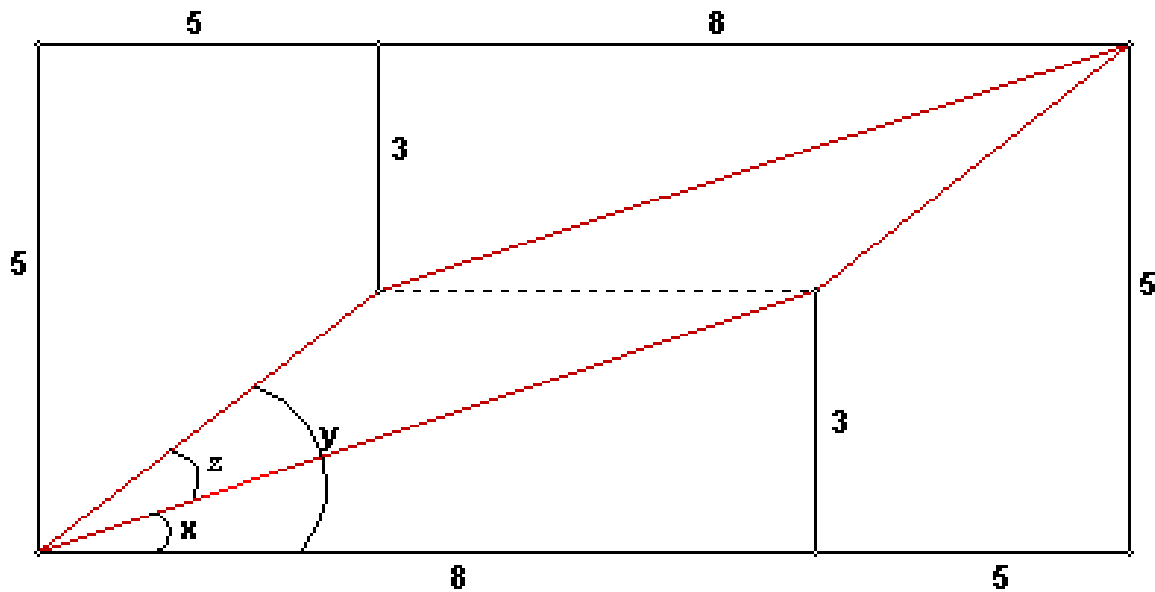




# The University of Georgia

EMAT 6700

There is in fact a space in the middle, which I have blown up below. Can you find the area of the red quadrilateral below with out using your calculator?



$$\tan x = \frac{3}{8} \Rightarrow \tan^{-1}\left(\frac{3}{8}\right) = x$$

$$\tan y = \frac{2}{5} \Rightarrow \tan^{-1}\left(\frac{2}{5}\right) = y$$

$$A = \frac{1}{2}ah = \frac{1}{2}ab \sin z$$

$$\sin z = \frac{b}{h} \Rightarrow h = \frac{b}{\sin z}$$

$$A = 2\left(\frac{1}{2} ab \sin z\right)$$

$$A = ab \sin z$$

$$A = \sqrt{2^2 + 5^2} \sqrt{8^2 + 3^2} \sin \left[ \tan^{-1} \left( \frac{2}{5} \right) - \tan^{-1} \left( \frac{3}{8} \right) \right]$$

$$A = \sqrt{29} \sqrt{73} \left[ \sin \left( \tan^{-1} \frac{2}{5} \right) \cos \left( \tan^{-1} \frac{3}{8} \right) - \sin \left( \tan^{-1} \frac{3}{8} \right) \cos \left( \tan^{-1} \frac{2}{5} \right) \right]$$

$$A = \sqrt{29} \sqrt{73} \left[ \frac{2}{\sqrt{29}} \times \frac{8}{\sqrt{73}} - \frac{3}{\sqrt{73}} \times \frac{5}{\sqrt{29}} \right]$$

$$A = 16 - 15 = 1$$