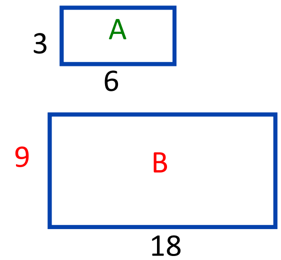
7.1-B- Ratios of perimeters and areas

k	k^2	k^3
2		
	25	
		27
$\frac{2}{7}$		
	$\frac{9}{4}$	
		$\frac{8}{27}$

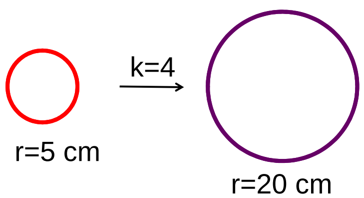
Understanding the perimeter ratio of two similar rectangles

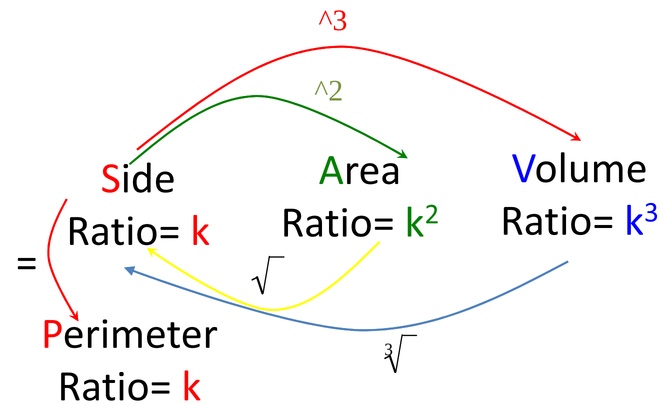
Ex 1: Figures A and B are similar



Understanding the area ratio of two similar circles

Ex 2:

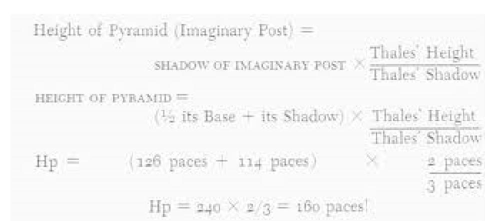




Application of Similar Triangles

The 3 great pyramids of Egypt are Khufo, Khafre, Menkaure

Their heights were unknown for over 2000 years, until about 600 BC, when Thales of Miletus, a Greek Mathematician calculated it.



Height of Pyramid (Imaginary Post) =

$$\text{SHADOW OF IMAGINARY POST} \times \frac{\text{Thales' Height}}{\text{Thales' Shadow}}$$

HEIGHT OF PYRAMID =

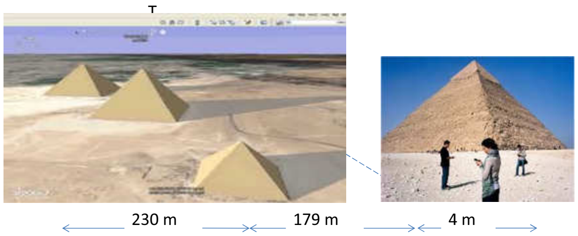
$$(\tfrac{1}{2}\text{ its Base} + \text{its Shadow}) \times \frac{\text{Thales' Height}}{\text{Thales' Shadow}}$$

$$Hp = (126 \text{ paces} + 114 \text{ paces}) \times \frac{2 \text{ paces}}{3 \text{ paces}}$$

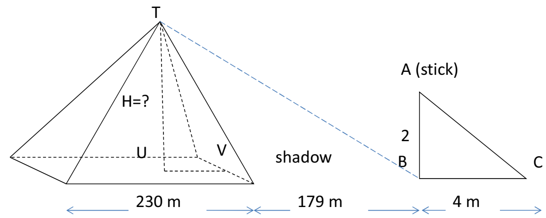
$$Hp = 240 \times 2/3 = 160 \text{ paces!}$$

(In his days they were measuring in cubits instead of m; 1cubit = 44.16 cm which is about 1 arm length)

He measured the length of the base and the length of the shadow. He then placed a 2 m stick at the end of the shadow and measured its shadow, it was 4 m long.



Since the sun creates equal angles on the ground, we have similar triangles: $\Delta ABC \sim \Delta TUB$;



Since the sun creates equal angles on the ground, we have similar triangles: $\Delta ABC \sim \Delta TUB$;

UV = 230/2 = 115; so UB = 115 + 179 = 294m

Practice: page 218 # 6-10