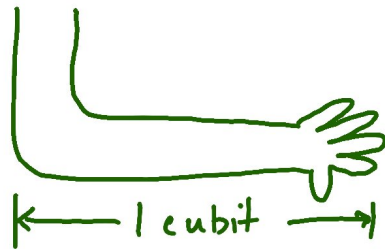


Section 6.3 Egyptian Geometry

The basic measure in Egyptian math uses the cubit



1 cubit = 7 palms
1 palm = 4 fingers
1 khet = 100 cubits

} length measurements

1 setat = 1 square khet
= 10,000 cubits²

} area

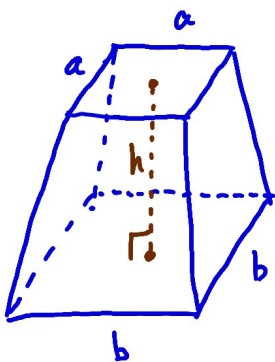
100 cubits
1 setat
= 10,000 cubits²
100 cubit

1 khar = $\frac{2}{3}$ cubic cubit

} Volume

Truncated Pyramid

↳ square bases



Volume, $V = \frac{h}{3} (a^2 + ab + b^2)$
h = height

ex: Find the volume of a truncated pyramid 15 cubits high with top 6 cubits by 6 cubits and bottom 18 cubits by 18 cubits

$$h=15, a=6, b=18$$

$$V = \frac{15}{3} (6^2 + 6 \cdot 18 + 18^2)$$

$$V = 5 (36 + 108 + 324)$$

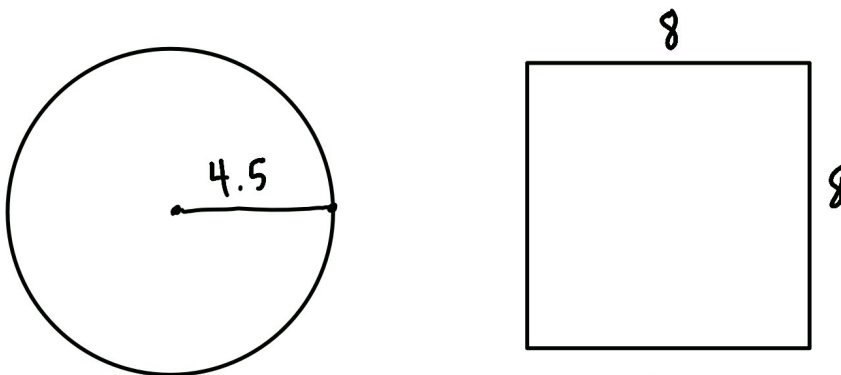
$$V = 5(468)$$

$$V = 2,340 \text{ cubits}^3 \cdot \frac{1 \text{ khar}}{\frac{2}{3} \text{ cubits}^3}$$

$$V = 3,510 \text{ khar}$$

2000 BC "Rhind Papyrus"

The area of a circle of diameter 9 is the same as the area of a square with side 8.



p 419-420
5, 9, 13a, b,
15a, b, 17,
20-24

Egyptian approximation for π .

$$\pi \cdot 4.5^2 = 8^2$$

$$\pi \cdot 20.25 = 64$$

$$\pi = \frac{64}{20.25} = \frac{256}{81} \approx 3.16$$

$$9) \pi r^2 = s^2$$
$$\frac{256}{81} \cdot 12^2 = s^2$$

$$s = \sqrt{\frac{256}{81} \cdot 12^2}$$

$$s = \frac{16}{9} \cdot 12 \approx 21$$