

16.3 Area of Trapezoids, Kites, and Rhombi

NOTES

TRAPEZOIDS:

$$A = \frac{1}{2} (\text{base}_1 + \text{base}_2) \text{height}$$



$$A = \frac{1}{2} (b_1 + b_2) h$$

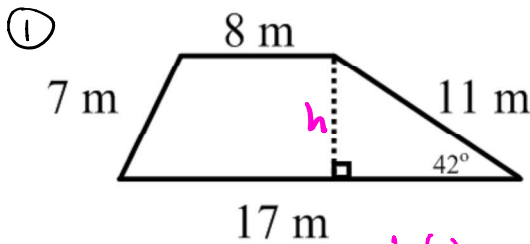
$$A = \frac{1}{2} (205 + 511) (309)$$

$$A = \frac{1}{2} (716) 309$$

$$A = 110,622 \text{ mi}^2$$

TRY IT!

Find the area of the trapezoid:



$$\sin 42^\circ = \frac{h}{11}$$

$$11 \sin 42^\circ = h$$

$$7.36 \approx h$$

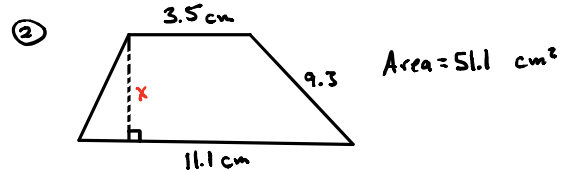
$$A = \frac{1}{2} (b_1 + b_2) h$$

$$A = \frac{1}{2} (17 + 8) 7.36$$

$$A = \frac{1}{2} (25) 7.36$$

$$A \approx 55.2 \text{ m}^2$$

Find the height of the trapezoid:



$$A = \frac{1}{2} (b_1 + b_2) h$$

$$51.1 = \frac{1}{2} (11.1 + 3.5) h$$

$$51.1 = \frac{1}{2} (14.6) h$$

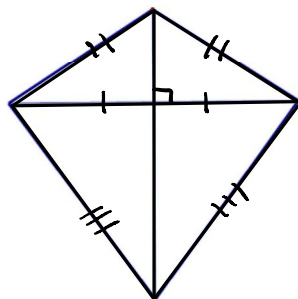
$$51.1 = 7.3 \cdot h$$

$$7 \text{ cm} = h$$

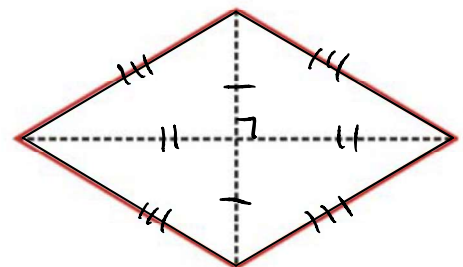
KITES AND RHOMBUSES:

$$A = \frac{1}{2} \text{diagonal}_1 \text{diagonal}_2$$

Kite



Rhombus



Write your questions here!

AREA FORMULAS:

Parallelogram = $b \cdot h$

Trapezoid = $\frac{1}{2} (b_1 + b_2) h$

Triangle = $\frac{1}{2} bh$

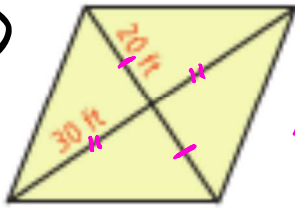
Kite and Rhombus = $\frac{1}{2} d_1 d_2$

TRY IT! Find the area of the following:

NORMAL

Rhombus

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$$A = \frac{1}{2} d_1 d_2$$

$$= \frac{1}{2} (40)(60)$$

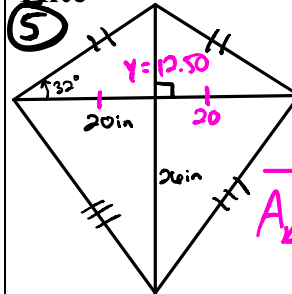
$$A = 120 \text{ ft}^2$$

TRIG

sine, cosine, tangent

Kite

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$$\tan 32^\circ = \frac{y}{20}$$

$$20 \tan 32^\circ = y$$

$$12.50 \approx y$$

$$A_k = \frac{1}{2} d_1 d_2$$

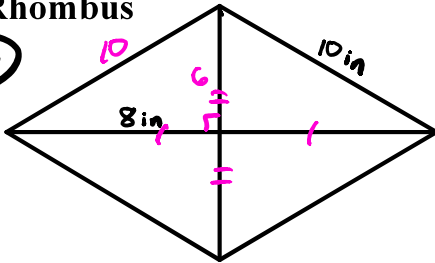
$$= \frac{1}{2} (40)(38.50)$$

$$A = 770 \text{ in}^2$$

PYTHAGOREAN THEOREM

Rhombus

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$$A = \frac{1}{2} d_1 d_2$$

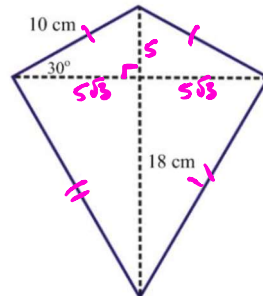
$$= \frac{1}{2} (12)(16)$$

$$A = 96 \text{ in}^2$$

SPECIAL RIGHT TRIANGLES

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Kite



$$A_k = \frac{1}{2} d_1 d_2$$

$$= \frac{1}{2} (10\sqrt{3})(23)$$

$$A_k = 115\sqrt{3} \text{ cm}^2$$

Summarize your notes!