

TOPIC: 11.1/11.2 Areas of Triangles and Quadrilaterals

NAME: Key
DATE:

ESSENTIAL QUESTION: How do find the area of a quadrilateral?

QUESTIONS:

Postulate 24: Area of a Square Postulate

The area of a square is the square of the length of its side. *Area = (side)²



Postulate 25: Area Congruence Postulate

If two polygons are congruent then they have the same area.

Postulate 26: Area Addition Postulate

The area of a region is the sum of the areas of its non-overlapping parts.

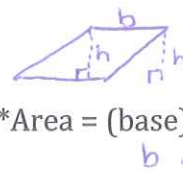
Theorem 11.1: Area of a Rectangle

The area of a rectangle is the product of its base and height. *Area = (base)(height)



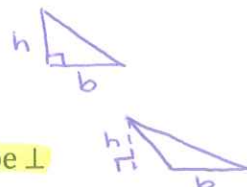
Theorem 11.2: Area of a Parallelogram

The area of a parallelogram is the product of its base and its corresponding height. *Area = (base)(height)



Theorem 11.3: Area of a Triangle

The area of a triangle is 1/2 the product of its base and its corresponding height. *Area = $\frac{1}{2}$ (base)(height) *base and height must be \perp

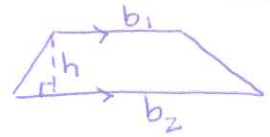


SUMMARY:

QUESTIONS:

Theorem 11.4: Area of a Trapezoid

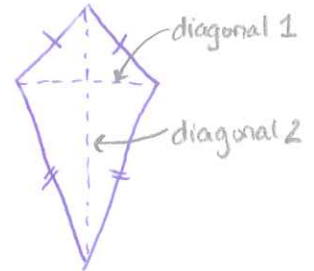
The area of a trapezoid is one-half the product of its height and the Sum of the base lengths.



*Area = $\frac{1}{2}$ (height)(base₁ + base₂)

Theorem 11.5/11.6: Area of a Rhombus or Kite

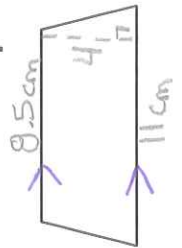
The area of either a rhombus or kite is one-half the product of the diagonal lengths.



*Area = $\frac{1}{2}$ (diagonal₁ • diagonal₂)

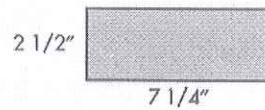
A1. Use the trapezoid at the right to place the following...

- a. Base lengths of 8.5 cm and 11 cm b. Height of 4 cm



A2. Find the area.

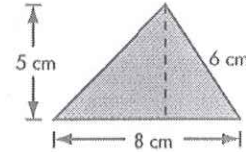
a. Rectangle



$A = (2\frac{1}{2})(7\frac{1}{4}) = (\frac{5}{2})(\frac{29}{4}) = \frac{145}{8}$

$A = 18\frac{1}{8} \text{ in}^2$

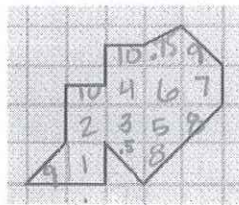
b. Triangle



$A = \frac{1}{2} b \cdot h$
 $\frac{1}{2} (8)(5)$

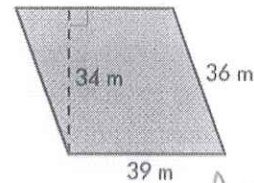
$A = 20 \text{ cm}^2$

c. One square = 1un²



11.25 un^2

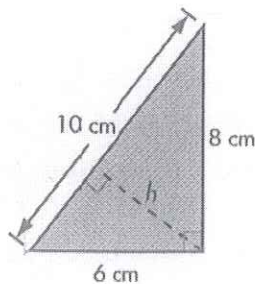
d. Parallelogram



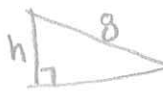
$A = (39)(34)$

$A = 1326 \text{ m}^2$

A3. Find h. Then find the area of the triangle.



$\frac{h}{6} = \frac{8}{10}$



$10h = 48$

$h = 4.8$



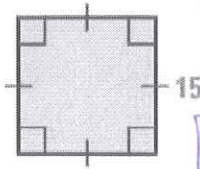
$A = \frac{1}{2} (b)(h)$

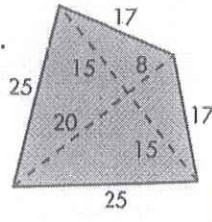
$\frac{1}{2} (6)(8)$

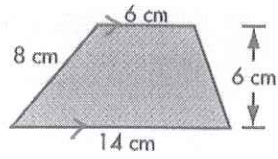
$A = 24 \text{ cm}^2$

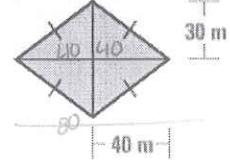
QUESTIONS:

A4. Find the area.

a. 
 Handwritten: SQUARE
 $A = 15^2$
 $A = 225 \text{ un}^2$

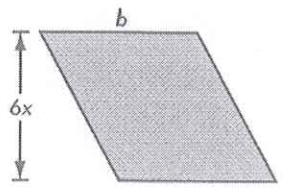
b. 
 Handwritten: Kite
 $A = \frac{1}{2} (28 \cdot 30)$
 $\frac{1}{2} (840)$
 $A = 420 \text{ un}^2$

c. 
 Handwritten: Trap
 $A = \frac{1}{2} (6) (14 + 6)$
 $A = 3 (20)$
 $A = 60 \text{ cm}^2$

d. 
 Handwritten: Rhombus
 $A = \left(\frac{1}{2}\right) (80) (60) = 40 \cdot 60$
 $A = 2400 \text{ m}^2$

A5. Find the value of b (may be in terms of x).

a. Area = $48x^2$ (parallelogram)



$$A = b \cdot h$$

$$48x^2 = b(6x)$$

$$b = \frac{48x^2}{6x} = 8x \text{ units}$$

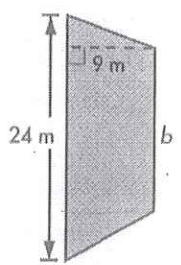
b. Area = 180 m^2 (trapezoid)

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

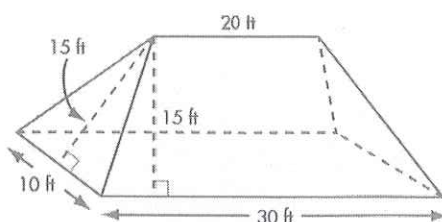
$$180 = \frac{1}{2} (9) (b + 24)$$

$$\frac{180}{4.5} = 40 = b + 24$$

$$b = 16 \text{ m}$$



A6. The roof on Crystal's cottage is made up of two isosceles trapezoids and two isosceles triangles. If a bundle of shingles cover 33 square feet of roof area, how many bundles of shingles will be needed to cover Crystal's roof?



$$A(\text{Trap}) = \frac{1}{2} (15) (30 + 20)$$

$$A = 7.5 (50) = 375$$

$$A(\Delta) = \frac{1}{2} (10) (15) = 75$$

$$\text{Total Area} = 2(375) + 2(75) = 900 \text{ ft}^2$$

$$\frac{900}{33} = 27.27$$

28 bundles

