Warm Up
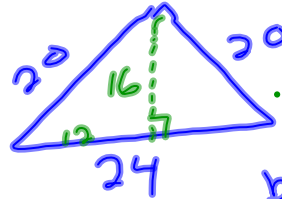
1. Find the area of a parallelogram with height 12 feet and base 8 feet.

   $A = b \cdot h = 8 \cdot 12$

   $A = 96 \ ft^2$

2. Find the area of an isosceles triangle with sides 20, 20, and 24 units.

   $A = \dfrac{b \cdot h}{2} = \dfrac{24 \cdot 16}{2}$

   $A = 192$

3. Solve: $200 = \frac{1}{2} x (18 + 22)$

   $9x + 11x$

   $200 = 20x$
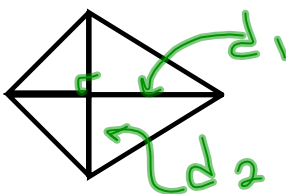
   $\boxed{x = 10}$

11-2   Areas of trapezoids, rhombuses, and kites
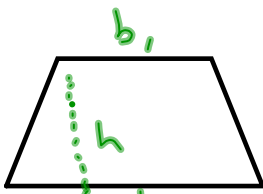
$A = \dfrac{(b_2 + b_1) h}{2}$
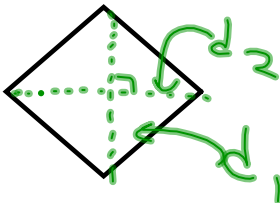
$A = \dfrac{d_1 \cdot d_2}{2}$

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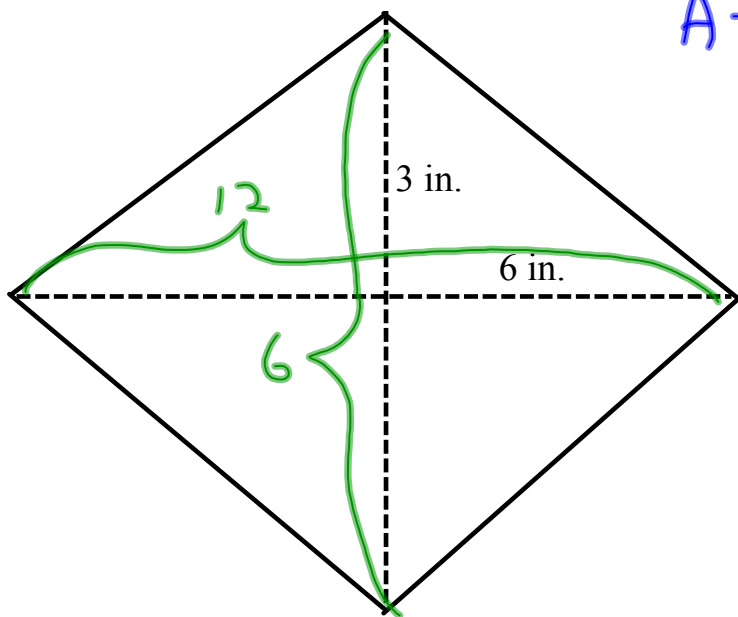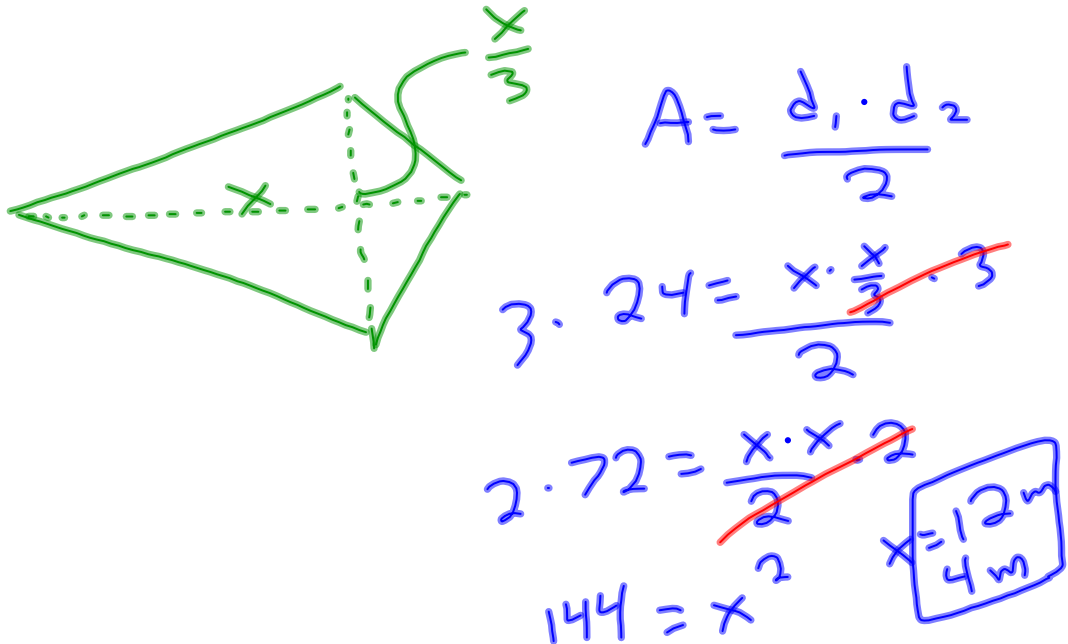
Ex 1   Find the area of the trapezoid.

12 in.

20 in.

18 in.
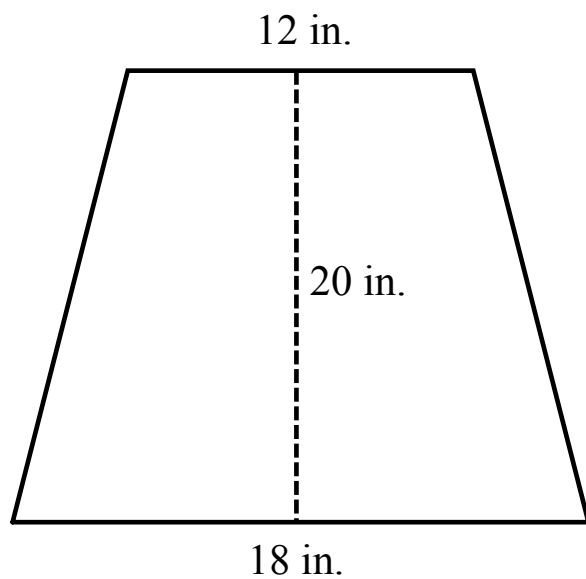
$$A = \frac{(12+18)\,20}{2}$$

$$= \frac{30 \cdot 20}{2}$$

$$= 300 \text{ in}^2$$

Ex 2   Find the area of the rhombus.

12

3 in.

6 in.

6

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

$$= \frac{12 \cdot 6}{2}$$

$$= 36 \text{ in}^2$$

Ex 3   One diagonal of a kite is $\frac{1}{3}$ as long as the other. The area of the kite is 24 square meters. What are the lengths of the diagonals?
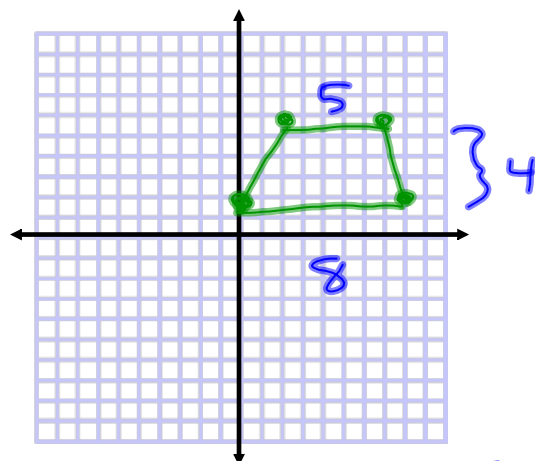
$$A = \frac{d_1 \cdot d_2}{2}$$

$$3 \cdot 24 = \frac{x \cdot \frac{x}{3} \cdot 3}{2}$$

$$2 \cdot 72 = \frac{x \cdot x \cdot 2}{2}$$

$$144 = x^2$$

$$x = \begin{array}{c} 12m \\ 4m \end{array}$$

Ex. 4   Find the area of quadrilateral *ABCD.*

A (0, 2)
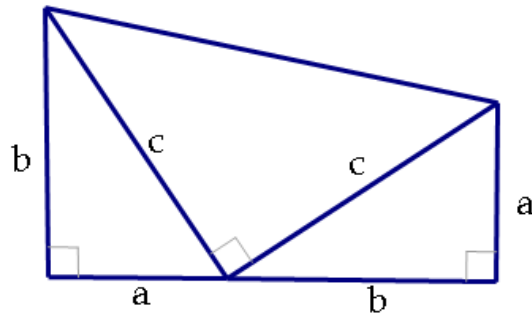
B (8, 2)

*C* (2, 6)

D (7, 6)

$$A = 6 \cdot \frac{5 \cdot 4}{}$$

$$= 26$$

Ex 5   James A. Garfield the twentieth president of the United States, discovered a proof of the Pythagorean Theorem in 1876. His proof involved the fact that a trapezoid can be formed from two congruent right triangles and an isosceles right triangle. use the diagram to show that $a^2 + b^2 = c^2$.
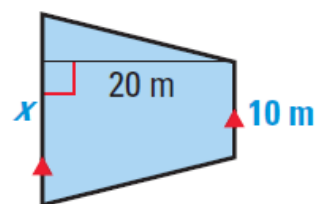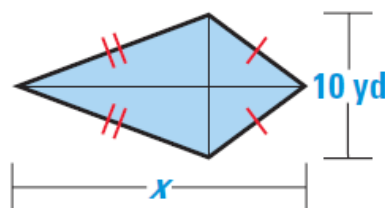
Ex. 6   Find the value of x.

$A = 300$ m²

$A = 108$ ft²

22 ft

x

14 ft

20 m

x 10 m

$A = 100$ yd²

10 yd

x
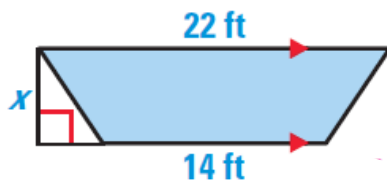
Ex. 7   Find the area of the shaded region.