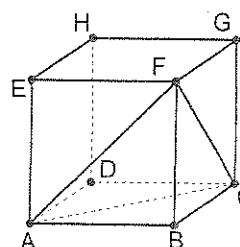


1. Each edge of the cube has length 5"

a. Find AF (diagonal of a face)

$$5\sqrt{2}''$$



b. Find AG (diagonal of the cube)

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 5^2 + 5^2 &= c^2 \\ 25 + 25 &= c^2 \end{aligned}$$

c. Find $m\angle FAC$

$$60^\circ$$

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 5^2 + 5^2 &= c^2 \\ 25 + 25 &= c^2 \end{aligned}$$

$$\begin{aligned} 25 + 50 &= c^2 \\ c^2 &= 75 \end{aligned}$$

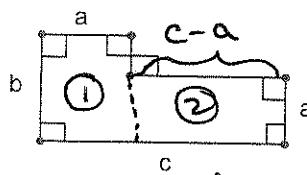
$$c = \sqrt{75}$$

$$= \pm \sqrt{25 \cdot 3}$$

$$= \pm 5\sqrt{3}$$

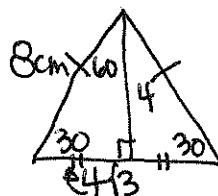
$$(AG = 5\sqrt{3})''$$

3. Find the area of the region in terms of a, b, and c



$$\begin{aligned} A_{\text{SHAPE}} &= A_{\text{RECT 1}} + A_{\text{RECT 2}} \\ &= a \cdot b + (c-a)(a) \\ &= ab + ac - a^2 \end{aligned}$$

5. Find the area of the region bounded by an isosceles triangle if the length of each of the congruent sides is 8 cm and a base angle has measure 30°



NOT DRAWN
TO SCALE

$$\begin{aligned} A &= \frac{1}{2} b \cdot h \\ &= \frac{1}{2} (8\sqrt{3})(4) \\ &= 16\sqrt{3} \end{aligned}$$

$$[16\sqrt{3} \text{ cm}^2]$$

2. Find area of triangle ABC if $AB = 9'$, $BC = 12'$ and $AC = 15'$

A

B

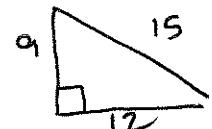
C

9

12

15

→



$$A = \frac{1}{2} b \cdot h$$

no height??

no angles??

is this a right??

$$a^2 + b^2 = c^2$$

$$9^2 + 12^2 = 15^2$$

$$81 + 144 = 225$$

$$225 = 225 \checkmark$$

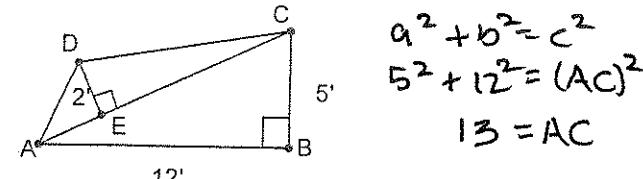
IT IS!!

$$\begin{aligned} A &= \frac{1}{2} b h \\ &= \frac{1}{2}(12)(9) \end{aligned}$$

$$= 54$$

$$[54']$$

4. What is the area of the region bounded by ABCD?



$$a^2 + b^2 = c^2$$

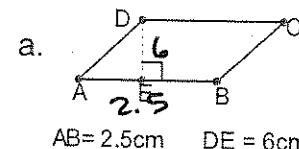
$$5^2 + 12^2 = (AC)^2$$

$$13 = AC$$

$$\begin{aligned} A_{\triangle ABC} &= A_{\triangle ABC} + A_{\triangle ADC} \\ &= \frac{1}{2}(12)(5) + \frac{1}{2}(13)(2) \\ &= 43 \end{aligned}$$

$$[43 \text{ ft}^2]$$

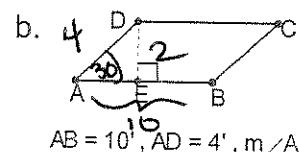
6. Find the area of parallelogram ABCD parallelogram with altitude \overline{DE} , if



a.

$$\begin{aligned} A &= bh \\ &= (6)(2.5) \\ &= 15 \end{aligned}$$

$$[15 \text{ cm}^2]$$



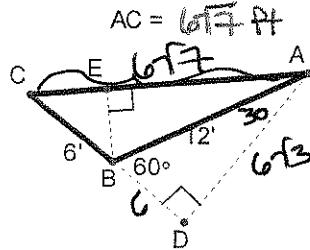
b.

$$\begin{aligned} A &= bh \\ &= (10)(4) \\ &= 40 \end{aligned}$$

$$[40 \text{ cm}^2]$$

1. $5\sqrt{2}''$, $5\sqrt{3}''$, 60° 2. $54 \text{ sq}'$ 3. $ab + ac - a^2$ 4. $43 \text{ sq}'$ 5. $16\sqrt{3} \text{ cm}^2$ 6. a. 15 cm^2 , 20 cm^2

7. Find the area of $\triangle ABC$ and BE

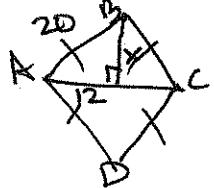


$$\begin{aligned} A_{\triangle ABC} &= \frac{1}{2}bh \\ &= \frac{1}{2}(6)(6\sqrt{3}) \\ &= 18\sqrt{3} \end{aligned}$$

$$\begin{aligned} b_1 h_1 &= b_2 h_2 \\ 6 \cdot 6\sqrt{3} &= 6\sqrt{7} \cdot h_2 \\ \frac{36\sqrt{3}}{6\sqrt{7}} &= h_2 \quad h_2 = \frac{6\sqrt{3}}{\sqrt{7}} \left(\frac{\sqrt{7}}{\sqrt{7}} \right) = \frac{6\sqrt{21}}{7} \end{aligned}$$

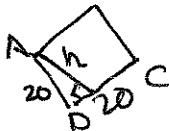
9. Rhombus ABCD with $AC = 24'$ and $AB = 20'$

a. Find area of the rhombus



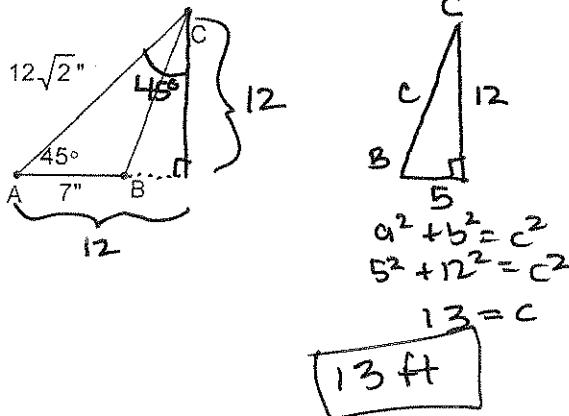
$$\begin{aligned} 12^2 + x^2 &= 20^2 \\ x &= 16 \\ A_{\text{RHOMBUS}} &= A_{4\text{AS}} = \frac{1}{2}(12)(16) \times 4 \\ &= 384 \quad [384 \text{ ft}^2] \end{aligned}$$

b. The length of an altitude to DC

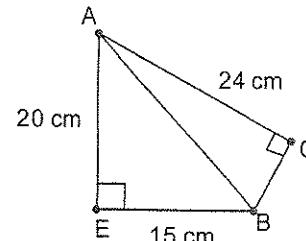


$$\begin{aligned} A &= bh \\ 384 &= 20(h) \quad [19.2 \text{ ft}] \\ 19.2 &= h \end{aligned}$$

11. Find BC (Hint: Draw altitude from C)



8. Find AB and BC

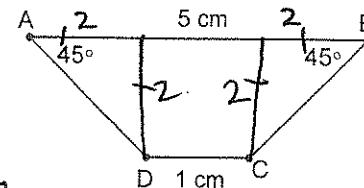


$$\begin{aligned} 20^2 + 15^2 &= AB^2 \\ 25 &= AB \quad [25 \text{ cm}] \end{aligned}$$

$$24^2 + BC^2 = 25^2$$

$$\begin{aligned} BC &= 7 \\ &\quad [7 \text{ cm}] \end{aligned}$$

10. Find the area of the isosceles trapezoid ABCD



$$\begin{aligned} A &= \frac{1}{2}(b_1 + b_2)h \\ &= \frac{1}{2}(5+1)(2) \\ &= 6 \\ &\quad [6 \text{ cm}^2] \end{aligned}$$

12. The area of the region bounded by a square is 81 cm^2 . The perimeter of the square is equal to the perimeter of an equilateral triangle. Find the area of the triangle.

$$\begin{aligned} * &\quad \boxed{+} \\ A &= 81 \text{ cm}^2 \\ P &= 4x \end{aligned}$$

$$\begin{aligned} x &= 9 \quad 4x = 3y \\ 4(9) &= 3y \\ 12 &= y \end{aligned}$$

$$\begin{aligned} * &\quad \boxed{+} \\ P &= 3y \end{aligned}$$

$$\begin{aligned} A &= \frac{1}{2}bh \\ &= \frac{1}{2}(12)(6\sqrt{3}) \\ &= 36\sqrt{3} \end{aligned}$$

$$[36\sqrt{3} \text{ cm}^2]$$

7. $18\sqrt{3} \text{ sq'}$, $\frac{6\sqrt{3}}{7} \text{ ft}^2$ 8. 25 cm, 7 cm 9. 384 sq', 19.2 ft 10. 6 sq cm 11. 13" 12. $36\sqrt{3} \text{ sq cm}$