

Answer the following with always, sometimes, or never.

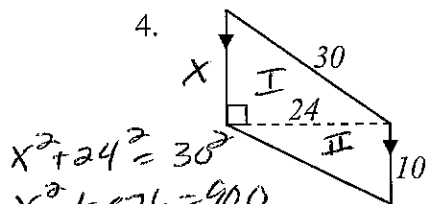
- The area of a trapezoid is $A = \frac{1}{2}mh$ Never $A = mh$ $m = \frac{1}{2}(b_1 + b_2)$
- An isosceles triangle has three altitudes of equal length. Sometimes (if Δ is equilateral)
- The area of a square inscribed in a circle of diameter d is $\frac{1}{2}r^2$ Always



$$\left(\frac{r\sqrt{2}}{2}\right)^2 = \frac{r^2 \cdot 2}{4} = \frac{1}{2}r^2$$

Find the area of the following figures.

4.



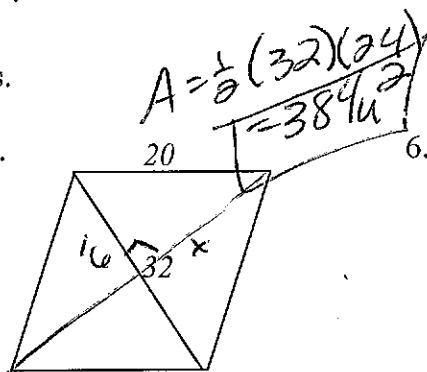
$$\begin{aligned} x^2 + 24^2 &= 30^2 \\ x^2 + 576 &= 900 \\ x^2 &= 324 \\ x &= 18 \end{aligned}$$

$$A_I = \frac{1}{2}(18)(24) = 216 \text{ u}^2$$

$$A_{II} = \frac{1}{2}(10)(24) = 120 \text{ u}^2$$

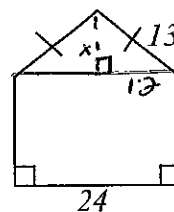
$$\text{Total} = 336 \text{ u}^2$$

5.



$$\begin{aligned} \text{rhombus} \\ 16^2 + x^2 &= 20^2 \\ 256 + x^2 &= 400 \\ x^2 &= 144 \\ x &= 12 \\ d_2 &= 24 \end{aligned}$$

6.



$$\begin{aligned} x^2 + 12^2 &= 13^2 \\ x^2 + 144 &= 169 \\ x^2 &= 25 \\ x &= 5 \end{aligned}$$

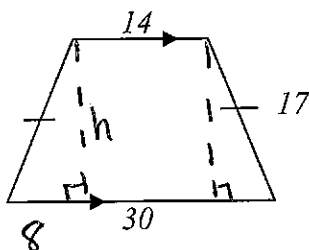
$$A_D = \frac{1}{2}(24)(5) = 60$$

$$A_{\text{rect}} = 24(17) = 408$$

$$\text{Total} = 468 \text{ u}^2$$

Find the areas of the trapezoids

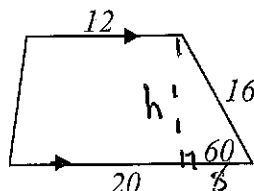
7.



$$\begin{aligned} h^2 + 8^2 &= 17^2 \\ h^2 + 64 &= 289 \\ h^2 &= 225 \\ h &= 15 \end{aligned}$$

$$\begin{aligned} A &= \frac{1}{2}(15)(14+30) \\ &= \frac{1}{2}(15)(44) \\ &= 330 \text{ u}^2 \end{aligned}$$

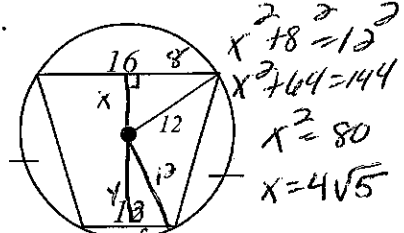
8.



$$h = 8\sqrt{3}$$

$$\begin{aligned} A &= \frac{1}{2}(8\sqrt{3})(12+20) \\ &= \frac{1}{2}(8\sqrt{3})(32) \\ &= 128\sqrt{3} \text{ u}^2 \end{aligned}$$

9.



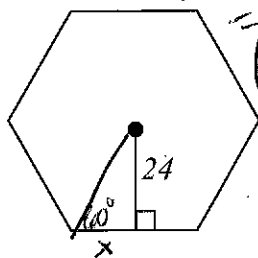
$$\begin{aligned} x^2 + 8^2 &= 12^2 \\ x^2 + 64 &= 144 \\ x^2 &= 80 \\ x &= 4\sqrt{5} \end{aligned}$$

$$\begin{aligned} h &= 4\sqrt{5} + 6\sqrt{3} \\ &\approx 8.94 + 10.39 \\ &\approx 19.33 \end{aligned}$$

$$A = \frac{1}{2}(19.33)(16+12) = 270.16 \text{ u}^2$$

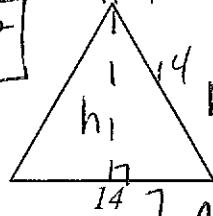
Find the areas of the regular polygons.

10.



$$A = \frac{1}{2}(24)(16\sqrt{3})$$

$$A = 192\sqrt{3}$$



$$h^2 + 7^2 = 14^2$$

$$h^2 + 49 = 196$$

$$h^2 = 147$$

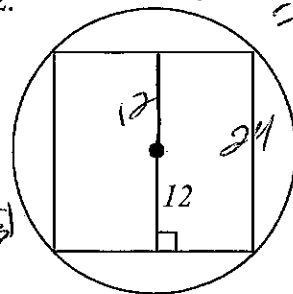
$$h = \sqrt{147}$$

$$h = 7\sqrt{3}$$

$$A = \frac{1}{2}(14)(7\sqrt{3})$$

$$A = 49\sqrt{3}$$

12.

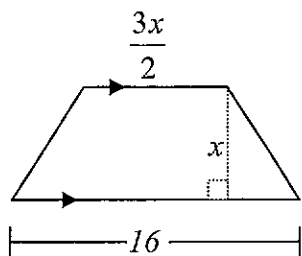


$$A = 24^2$$

$$A = 576$$

Find the value of x for each of the following.

13.



$$A = 75$$

$$75 = \frac{1}{2}x\left(\frac{3x}{2} + 16\right)$$

$$150 = \frac{3x^2}{2} + 16x$$

$$300 = 3x^2 + 32x$$

$$0 = 3x^2 + 32x - 300$$

$$0 = (3x + 50)(x - 6)$$

$$3x + 50 = 0$$

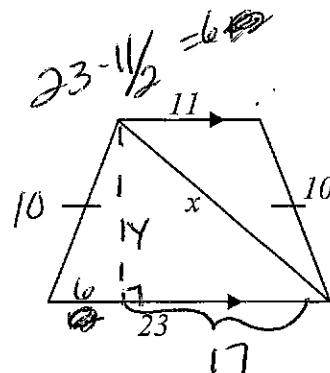
$$3x = -50$$

$$x = -\frac{50}{3}$$

$$x - 6 = 0$$

$$x = 6$$

14.



$$y^2 + 6^2 = 10^2$$

$$y^2 + 36 = 100$$

$$y^2 = 64$$

$$y = 8$$

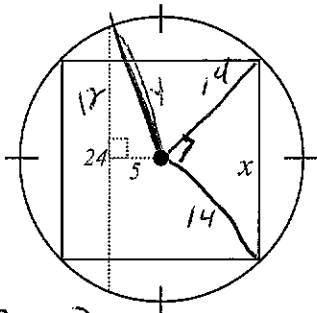
$$8^2 + 17^2 = x^2$$

$$64 + 289 = x^2$$

$$353 = x^2$$

$$18.79 \approx x$$

15.



$$5^2 + 12^2 = y^2$$

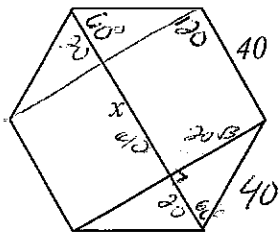
$$25 + 144 = y^2$$

$$169 = y^2$$

$$14 = y$$

$$x = 14\sqrt{2}$$

16.



regular hexagon

$$x = 60 \text{ or } 80$$