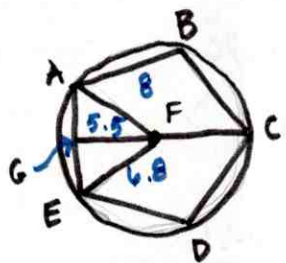


11.6

- 1) Identify the center of the regular polygon ABCDE. F
- 2) Identify a central angle of the polygon. $\angle AFE$
- 3) What is the radius of the polygon? $EF = 6.8$
- 4) What is the apothem? $GF = 5.5$



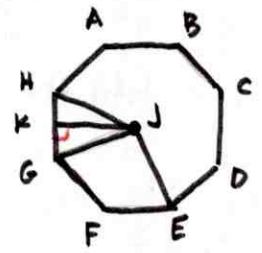
5) Explain how to find the measure of a central angle of a regular polygon with n sides. Central angle equals 360° divided by the number of sides, n. $\theta = 360/n$

Find the measure of a central angle with the given number of sides. $\theta = \frac{360}{n}$

- | | | | |
|---|---|---|--|
| 6) 10 sides
$n=10$
$\theta = \frac{360}{10}$
$\theta = 36^\circ$ | 7) 18 sides
$n=18$
$\theta = \frac{360}{18}$
$\theta = 20^\circ$ | 8) 24 sides
$n=24$
$\theta = \frac{360}{24}$
$\theta = 15^\circ$ | 9) 7 sides
$n=7$
$\theta = \frac{360}{7}$
$\theta = 51.4^\circ$ |
|---|---|---|--|

Find the given angle measure for the regular octagon. $n=8$

- | | |
|---|--|
| 10) $m\angle GJH$
$\frac{360}{8} = 45^\circ$ | 11) $m\angle GJK$
$\frac{45}{2} = 22.5^\circ$ |
| 12) $m\angle KGJ$
$90 - 22.5 = 67.5^\circ$ | 13) $m\angle EJK$
$3(45) = 135^\circ$ |



Find the area of the regular polygon.

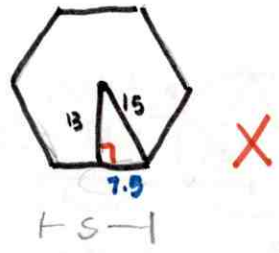
- | | | | |
|--|--|---|---|
| 14) $n=3$
$a=2\sqrt{3}$
$S=12$
$P=36$
$3(12)$
$A = \frac{2\sqrt{3}(36)}{2}$
$= 36\sqrt{3}u^2$
$62.4u^2$ | 15) $n=9$
$a=9.4$
$S=6.84$
$r=10$
$P=61.56$
$9(6.84)$
$a^2 = 10^2 - (3.42)^2$
$a = 9.4$ | 16) $n=7$
$a=2.5$
$r=2.77$
$S=2.4$
$P=16.8$
$7(2.4)$
$A = \frac{9.4(61.56)}{2}$
$A = 289.3u^2$ |
$x^2 = (2.77)^2 - (2.5)^2$
$x = 1.2$
$* S = 2(1.2) = 2.4$
$A = \frac{2.5(16.8)}{2}$
$A = 21u^2$ |
|--|--|---|---|

17) Describe and correct the error in finding the area of a regular hexagon.

$\sqrt{15^2 - 13^2} \approx 7.5$

$A = \frac{1}{2} a \cdot ns$

$A = \frac{1}{2} (13)(6)(7.5) \approx 292.5$

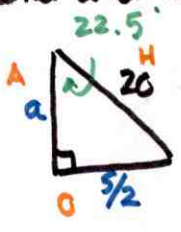


7.5 is $\frac{s}{2}$. You must double it to get s. $S = 2(7.5) = 15$ $P = 6(15) = 90$

$A = \frac{13(90)}{2} = 585u^2$

Find the perimeter and area of the regular polygon.

19) $n=8$
 $r=20$
 $S=15.2$
 $P=121.6$
 $a=18.5$

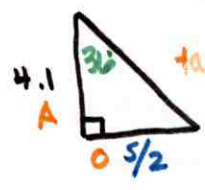


$\theta = \frac{360}{8} = 45 \rightarrow \frac{\theta}{2} = 22.5$
 $\cos(22.5) = \frac{a}{20}$
 $a = 20(\cos(22.5)) = 18.5$
 $\sin(22.5) = \frac{x}{20}$
 $x = 20(\sin(22.5)) = 7.6$
 $\frac{S}{2} = 7.6 \rightarrow S = 2(7.6) = 15.2$

$A = \frac{18.5(121.6)}{2}$
 $A = 1124.8 u^2$

$P = 8(15.2)$
 $P = 121.6 u$

20) $n=5$
 $a=4.1$
 $S=6$
 $P=30$
 $5(6)$

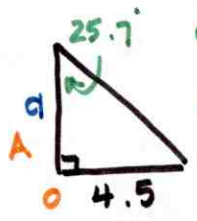


$\theta = \frac{360}{5} = 72$
 $\tan(36) = \frac{x}{4.1}$
 $x = 4.1(\tan(36)) = 3$
 $\frac{S}{2} = 3 \rightarrow S = 2(3) = 6$
 $S = 6$
 $P = 5(6) = 30$

$A = \frac{4.1(30)}{2}$
 $A = 61.5 u^2$

$P = 30 u$

21) $n=7$
 $S=9$
 $P=63$
 $a=9.4$



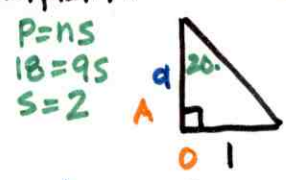
$\theta = \frac{360}{7} = 51.4 \rightarrow \frac{\theta}{2} = 25.7$
 $\tan(25.7) = \frac{4.5}{a}$
 $a = \frac{4.5}{\tan(25.7)} = 9.4$

$A = \frac{9.4(63)}{2}$
 $A = 296.1 u^2$

$P = 7(9)$
 $P = 63 u$

22) The perimeter of a regular nonagon is 18 in. Is that enough info to find the area? Find the area and explain.

$n=9$
 $P=18$
 $S=2$
 $a=2.7$

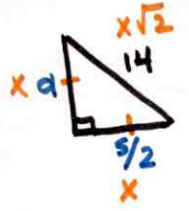


$\theta = \frac{360}{9} = 40 \rightarrow \frac{\theta}{2} = 20$
 $\tan(20) = \frac{1}{a}$
 $a = \frac{1}{\tan(20)} = 2.7$

$A = \frac{2.7(18)}{2}$
 $A = 24.3 u^2$

Find the area. Identify the method.

23) $n=4$
 $r=14$
 $S=14\sqrt{2}$
 $P=56\sqrt{2}$
 $a=7\sqrt{2}$

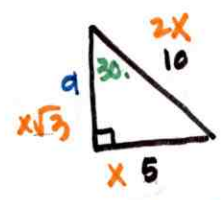


$x = 7\sqrt{2}$
 $x\sqrt{2} = 14$
 $\frac{S}{2} = 7\sqrt{2} \rightarrow S = 2(7\sqrt{2}) = 14\sqrt{2}$

$A = \frac{7\sqrt{2}(56\sqrt{2})}{2} \rightarrow 392(2)$
 $A = 392 u^2$

special b Δs

24) $n=6$
 $S=10$
 $r=10$
 $P=60$
 $a=5\sqrt{3}$

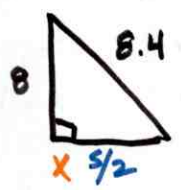


$x = 5$
 $x\sqrt{3} = 5\sqrt{3}$
 $2x = 10$

$A = \frac{5\sqrt{3}(60)}{2} = 150\sqrt{3} u^2$
 $= 259.8 u^2$

special b Δs

25) $n=10$
 $a=8$
 $r=8.4$
 $S=5.2$
 $P=52$
 $10(5.2)$



$x^2 = (8.4)^2 - 8^2$
 $x = 2.6$
 $\frac{S}{2} = 2.6 \rightarrow S = 2(2.6) = 5.2$

$A = \frac{8(52)}{2}$
 $A = 208 u^2$

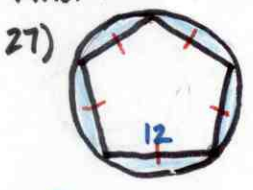
Pythagorean Thm.

26) Find the area of the unshaded region in #23.

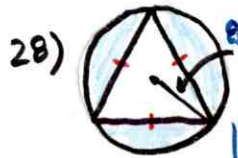
$A(\text{circle}) - A(\text{square})$
 $\pi(14)^2 - 392$
 $196\pi - 392$

$A(\text{unshaded}) = 223.8 u^2$

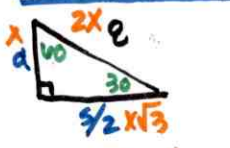
Find the area of the shaded region



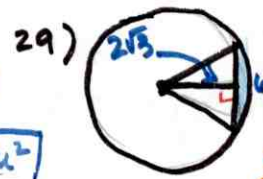
$A(\text{circle}) - A(\text{Pentagon})$
 $\pi(10.2)^2 - \frac{8 \cdot 3(60)}{2}$
 $A(\text{shaded}) = 77.9 u^2$



$n=3$
 $r=8$
 $a=4$
 $S=8\sqrt{3}$
 $P=24\sqrt{3}$



$A(\text{circle}) - A(\Delta)$
 $\pi(8)^2 - \frac{4(24\sqrt{3})}{2}$
 $A(\text{shaded}) = 117.9 u^2$



$A(\text{sector}) - A(\Delta)$
 $\frac{x}{\pi(4)^2} = \frac{60}{360}$
 $x = 8.4 - 4\sqrt{3}$

$A(\text{shaded}) = 1.5 u^2$

$n=5$
 $S=12$
 $P=60$
 $a=8.3$
 $r=10.2$



$\tan(36) = \frac{6}{a}$
 $a = 8.3$
 $\sin(36) = \frac{6}{r}$
 $r = 10.2$

$x = 2$
 $S = 4$
 $2x = 4$