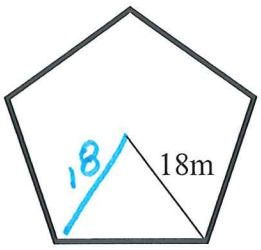
Name: Key

Area of Regular Polygons Practice (day one)

Find the area of each REGULAR polygon, rounding to the nearest tenth.

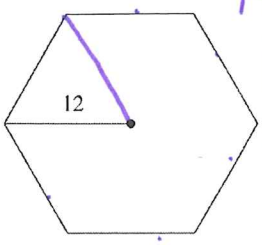
1.



$A = 5\,\frac{1}{2}\,18 \cdot 18 \sin 72$

$A = 770.4\,m^2$

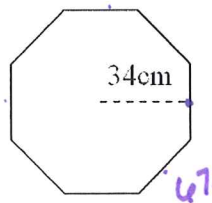
2.

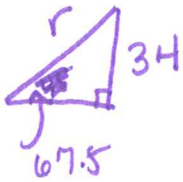


$A = 6\,\frac{1}{2}\,12^2 \sin 60$

$A = 374.1\,units^2$

3.





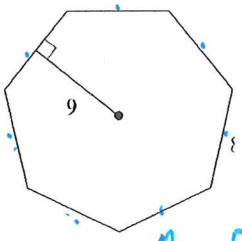
$\sin 67.5 = \frac{34}{r}$

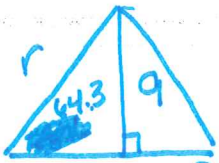
$r = 36.8\,cm$

$A = 8\,\frac{1}{2}\,(36.8)^2 \sin 45$

$A = 3830.4\,cm^2$

4.





$\sin 64.3 = \frac{9}{r}$

$r = 9.99$

$r = 10$

$A = 7\,\frac{1}{2}\,10^2 \sin 51.4°$

$A = 273.5\,units^2$

5. s = 12in

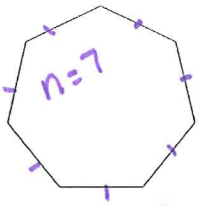
$\frac{\sin 72}{12} = \frac{\sin 54}{r}$

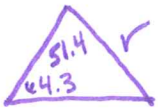
$r = 10.2\,in$

$A = 5\,\frac{1}{2}\,10.2^2 \sin 72$

$A = 247.4\,in^2$

6. S = 21km





$\frac{\sin 64.3}{r} = \frac{\sin 51.4}{7}$

$r = 8.1\,km$

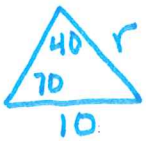
$A = 7\,\frac{1}{2}\,(8.1)^2 \sin 51.4$

$A \approx 717.9\,km^2$

7. Find the area of a **regular nonagon** with perimeter of 90cm.

$90 \div 9 = 10$

$S = 10$



$\frac{\sin 70}{r} = \frac{\sin 40}{10}$

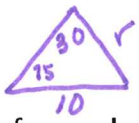
$r = 14.6\,cm$

$A = 9\,\frac{1}{2}\,(14.6)^2 \sin 40°$

$A \approx 616.6\,cm^2$

8. Find the area of a **regular dodecagon** with perimeter of 120m.

$120 \div 12 = 10 = S$



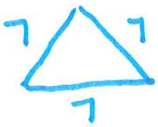
$\frac{\sin 75}{r} = \frac{\sin 30}{10}$

$r = 19.3\,m$

$A = 12\,\frac{1}{2}\,(19.3)^3 \sin 30$

$A = 1{,}117.5\,m^2$

9. Find the area of a **regular triangle** with perimeter of 21 km.

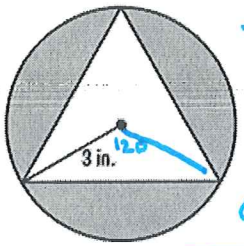


$A = \frac{1}{2}\,7^2 \sin 60°$

$A \approx 21.2\,km^2$

Find the area of each shaded region , rounding to the nearest tenth.

10.



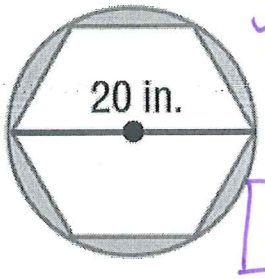
$\pi r^2 - 3\frac{1}{2}ab\sin\theta$

$\pi 3^2 - 3\frac{1}{2}3\cdot3\sin120$

$9\pi - 11.69$

$\boxed{A \approx 16.6\text{ in}^2}$

11.

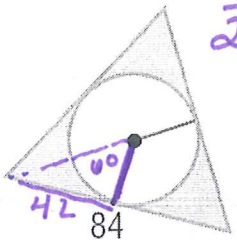


$\pi 10^2 - 6\frac{1}{2}10^2\sin60$

$100\pi - 259.8$

$\boxed{A \approx 54.4\text{ in}^2}$

12.



$\frac{1}{2}84^2\sin60 - \pi r^2$

$\frac{1}{2}84^2\sin60 - \pi(14\sqrt{3})^2$

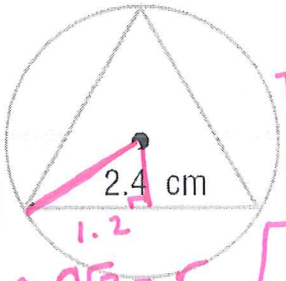
$3055.3 - 588\pi$

Find $r = 14\sqrt{3}$

$14\sqrt{3}$

$\boxed{A \approx 1208.0\text{ units}^2}$

13.



$\pi r^2 - \frac{1}{2}a^2\sin60$

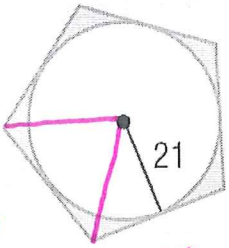
$\pi(0.8\sqrt{3})^2 - \frac{1}{2}2.4^2\sin60$

$1.92\pi - 2.5$

$0.8\sqrt{3} = r$

$\boxed{A = 3.5\text{cm}^2}$

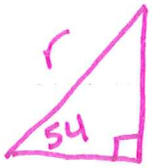
14.



$5\frac{1}{2}r\cdot r\sin72 - \pi 21^2$

$A = 5\frac{1}{2}26^2\sin72 - \pi 21^2$

$A = 1607.3 - 441\pi$

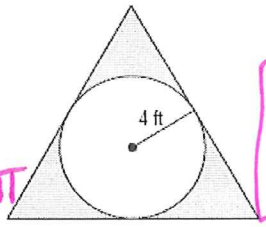


$\sin54 = \frac{21}{r}$

$r \approx 26.0$

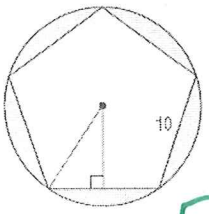
$\boxed{A = 221.8\text{ units}^2}$

15.



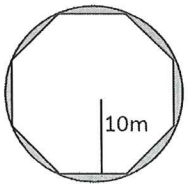
$\boxed{A = 32.8\text{ft}^2}$

16.



$\boxed{A = 55.2\text{units}^2}$

17.



$\boxed{A \approx 83.6\text{m}^2}$