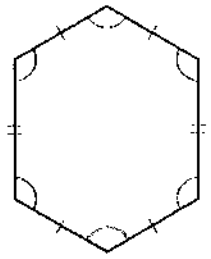
Geometry 6.1, 11.1, and 11.2 Review Name Key

For numbers 1 and 2, do the following: *(3 points each)*

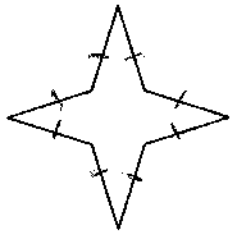
a) Name the polygon based on the number of sides.
b) Is the polygon equilateral, equiangular, regular, or none?
c) Is the polygon concave or convex?

1.



a) hexagon
b) equiangular
c) Convex

2.



a) octagon
b) equilateral
c) Concave

3. Find the sum of the measures of the interior angles in a convex 13-gon.

$(13-2)180 = 1980°$

4. Find the measure of each interior angle in a regular 13-gon.

$\frac{\text{total}}{\#\text{ sides}} = \frac{(13-2)180}{13} \approx 152.31°$

5. Find the sum of the measures of the exterior angles of a convex decagon.

$360°$

6. Find the measure of each exterior angle of a regular decagon.

$\frac{360°}{10} = 36°$

7. The measure of each interior angle of a regular *n*-gon is 162°. Find the value of *n*.

$\frac{(n-2)180°}{n} = 162$

$180n - 360 = 162n$

$18n = 360$ $n = 20$ sides

OR

$180 - 162°$

$18°$ ↗ exterior ∠

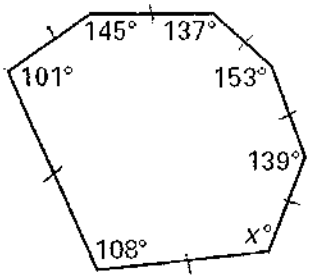
$\frac{360°}{18°} = 20$

interior ∠ $162°$ / $18°$ ext ∠

8. The measure of each exterior angle of a regular *n*-gon is 15°. Find the value of *n*.

$\frac{360°}{15} = 24$

9. Find the value of *x*.



7 sided polygon - heptagon

$(7-2)180 = 900°$ total ∠ sum

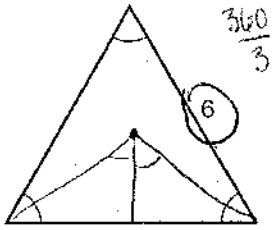
$x + 139 + 153 + 137 + 145 + 101 + 108 = 900$

783

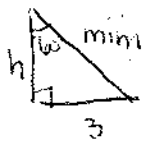
$x = 117°$

Find the area of each regular polygon:

10.



$\frac{360}{3} = 120°$ central ∠



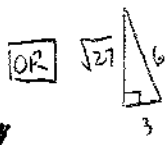
$\frac{6\sqrt{3}}{4} = \frac{36\sqrt{3}}{4}$

$\tan 60 = \frac{3}{h}$ $\quad h \approx 1.73$

$A_\Delta = \frac{1}{2}(1.73)(6) = 5.20$

$A_{big} = 15.59$

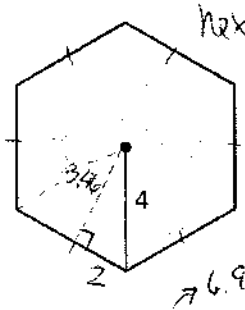
OR



$A = \frac{\sqrt{27}(6)}{2}$

$= 15.59$

11.



hexagon $\frac{360°}{6} = 60°$ central ∠

$\frac{x}{4} = \sin 30°$

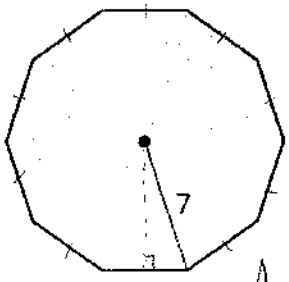
$\frac{h}{4} = \cos 30°$

6.92

$A_{big} = A_{small} \cdot 6$

$= 41.60$ units^2

12.



decagon $\frac{360°}{10} = 36°$ central ∠

$\sin 18 = \frac{x}{7}$ $\quad x = 2.16$

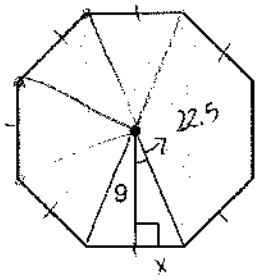
$\cos 18 = \frac{h}{7}$ $\quad h = 6.66$

$A_\Delta = \frac{1}{2}(6.66)(4.32) = 14.38$

$A_{10} = 10 \cdot A_\Delta = 10(14.38)$

$= 143.8$ units^2

13.



octagon $\frac{360°}{8} = 45°$

$\tan 22.5 = \frac{x}{9}$

$x \approx 3.73$

$A_\Delta = \frac{1}{2}(3.73)(2)(9)$

$= 33.55$

$A_{big} = A_\Delta \, 8$

$= (33.55)(8) = 268.41$ units^2

$\frac{45°}{2} = 22.5°$