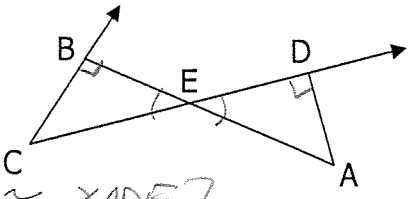
Geometry (H)
Review 3.1 – 3.5

Name: KEY

1. Given: $\overline{AB} \perp \overline{BC}$, $\overline{AD} \perp \overline{CD}$
   Prove: $\angle A \cong \angle C$

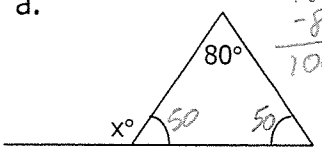


① $\overline{AB} \perp \overline{BC}$, $\overline{AD} \perp \overline{CD}$ → ② $\measuredangle CBE$ is right, $\measuredangle ADE$ is right → ③ $\measuredangle CBE \cong \measuredangle ADE$; ④ $\measuredangle BEC \cong \measuredangle DEA$ → ⑤ $\measuredangle A \cong \measuredangle C$

① Given
② ⊥ lines form rt $\measuredangle$s.
③ All right $\measuredangle$s $\cong$.
④ Vertical $\measuredangle$s $\cong$.
⑤ If 2 $\measuredangle$s of one $\triangle$ are $\cong$ to 2 $\measuredangle$s of another $\triangle$, then the 3rd $\measuredangle$s $\cong$.

2. Find the value of x.

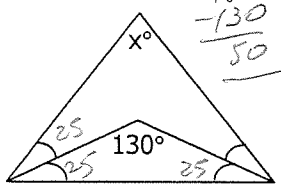
a.



180 − 80 = 100 → 100/2

x = 130°

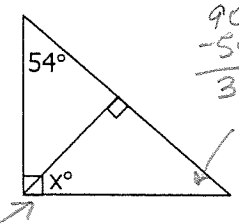
b.



180 − 130 = 50

x = 80

c.

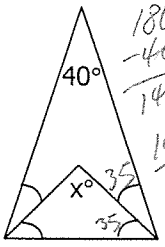


90 − 54 = 36

90 − 36 = 54

x = 54

d.



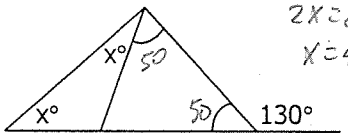
180 − 40 = 140

140/2 = 70 → 70/2 = 35

180 − 70 = 110

x = 110

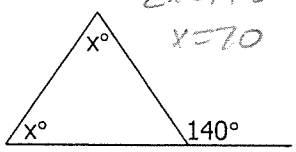
e.



2x + 50 = 130
2x = 80
x = 40

x = 40

e.



2x = 140
x = 70

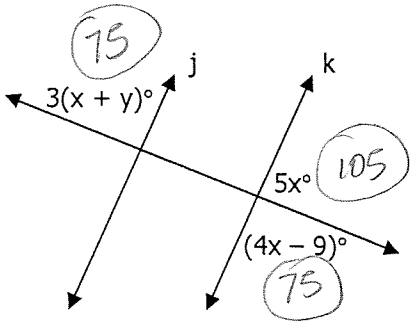
x = 70

3. Lines j and k are parallel. Find the value of x and y.

$3(x+y) = 4x - 9$
$5x + 4x - 9 = 180$

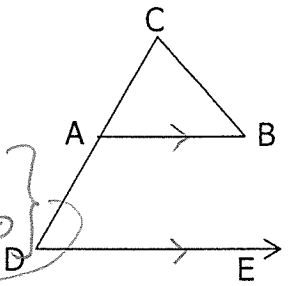
$9x = 189$
$x = 21$

$3(21+y) = 4(21) - 9$
$63 + 3y = 84 - 9$
$3y = 12$
$y = 4$



checks!

7. Given: $\overline{BA} \parallel \overline{DE}$
Prove: m∠B + m∠C + m∠D = 180



① $\overline{BA} \parallel \overline{DE}$ → ② ∠CAB ≅ ∠D → ③ m∠CAB = m∠D
④ m∠B + m∠C + m∠CAB = 180
⑤ m∠B + m∠C + m∠D = 180

① Given
② 2 ∥ lines trans. → corresp. ∠s ≅
③ Def of ≅ ∠s
④ Sum of meas. of ∠s of Δ = 180
⑤ Substitution

8. One of the acute angles of a right triangle has measure that is 5 less than four times the measure of the other. Find the measures of the angles.

Let x = measure of one acute ∠
(90 − x) = meas. of other " ∠

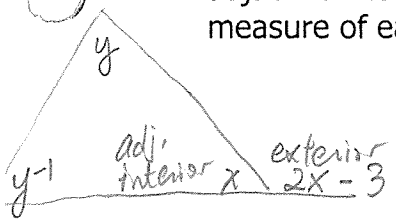
$x = 4(90-x) - 5$ or $90 - x = 4x - 5$

$95 = 5x$
$19 = x$

$4(19) - 5 = 71$ ✓
$19 + 71 = 90$ ✓

19°, 71°, 90°

9. The measure of an exterior angle of a triangle is 3 less than twice the measure of the adjacent interior angle. If the measures of the remote interior angles differ by 1, find the measure of each angle.



let x = adj. int. ∠
2x − 3 = exterior ∠
y = a remote interior ∠
y − 1 = other remote interior ∠

$x + 2x - 3 = 180$
$y + y - 1 = 2x - 3$

$3x = 183$
$x = 61$

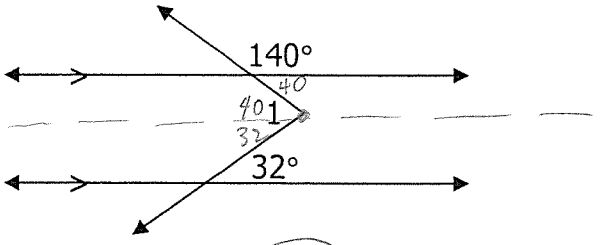
$2y = 2x - 2$
$2y = 2(61) - 2$
$y = 60$

exterior ∠ = 119
adj. int ∠ = 61
remote ∠ = 60
remote ∠ = 59

ck: 61 + 60 + 59 ≟ 180
60 + 59 ≟ 119 ✓
119 + 61 ≟ 180 ✓

10. Find the m∠1 in each figure.

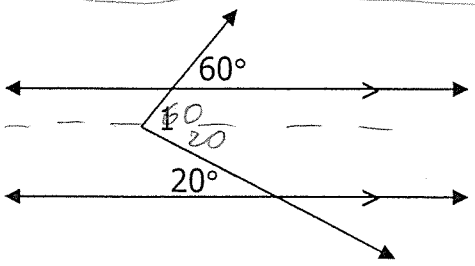
a.



Thru a pt outside a line there is exactly 1 line parallel to line.

40 + 32 = 72°

b.



60 + 20 = 80

1. If the measure of one of the angles of an equiangular polygon is 175°, find the number of sides of the polygon. (2 pts.)

n = # sides.

$\frac{(n-2)180}{n} = 175$ → $180n - 360 = 175n$, $n = 72$

$(n-2)(180) = 175n$

72 sides

OR

175 / exterior 5

$\frac{360}{n} = 5$

$5n = 360$

$n = 72$

2. In what polygon is the sum of the measures of the interior angles equal to three times the sum of the measures of the exterior angles? (2 pts.)

$(n-2)180 = 3(360)$

$n - 2 = 3(2)$

$n = 8$

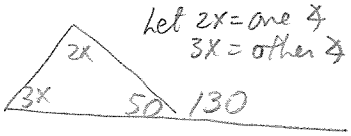
octagon

ck

$(8-2)180 = 1080$ ✓

$3(360) = 1080$

3. An exterior angle of a triangle has a measure of 130°. The remote interior angles are in a ratio of 2:3. Find the measure of the largest angle of the triangle. (2 pts.)



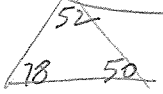
Let $2x$ = one ∠, $3x$ = other ∠

$2x + 3x = 130$

$5x = 130$

$x = 26$

largest ∠ = 78



ck $50 + 52 + 78 = 180$ ✓

$52 + 78 = 130$ ✓

52 : 78 = 2 : 3

4. The measure of each exterior angle of this regular polygon is half the measure of each interior angle. Name this polygon. (2 pts.)

interior ∠ ↓ $2x$ / x ↙ exterior ∠

Let x = meas. of exterior ∠

$2x$ = meas. of interior ∠

$3x = 180$

$x = 60$ (exterior)

interior ∠ = 120

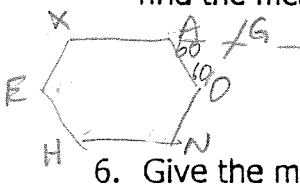
$\frac{360}{n} = 60$

$n = 6$ sides.

hexagon

ck: $\frac{(6-2)180}{6} = 120$ ✓

5. If the sides, $\overline{XA}$ and $\overline{NO}$ of regular hexagon HEXAON are extended to G, find the measure of ∠G. (3 pts.)



$\frac{360}{6} = 60$ ↙ each exterior ∠

$m\angle G = 60$

6. Give the most descriptive name for the polygon having an interior angle sum of 1800°. (2 pts.)

$(n-2)180 = 1800$

$n - 2 = 10$

$n = 12$

dodecagon

7. Seven angles of a decagon have measures whose sum is 1220°. Of the remaining three angles, exactly two are complements and exactly two are supplements. Find the measure of these three angles. (5 pts.)

50, 40, 130

3 ∠s ↑

$(10-2)180 = 1440$

-1220

$= 220$

3 remaining ∠s

Let x = one ∠

$90 - x$ = 2nd ∠

$180 - x$ = 3rd ∠

$x + 90 - x + 180 - x = 220$

$270 - x = 220$

$50 = x$

8. What is the name of the regular polygon if the ratio of the measure of an interior angle to the measure of the exterior angle is 7:2? (2 pts.)

Let $7x$ = meas. of int. ∠

$2x$ = meas. of ext. ∠

$9x = 180$

$x = 20$

interior ∠ = 140

ext. ∠ = 40

$\frac{360}{n} = 40$

$n = 9$ sides.

nonagon

ck $\frac{(9-2)180}{9} = 140$ ✓