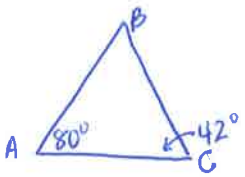
Geometry A
4.1 – 4.7 Quiz Review

Name : Key
Date : _____ Period : _____

Complete each question and be sure to show all work!

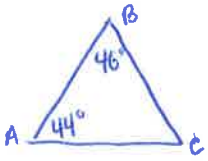
1. ΔABC has m∠C = 42° and m∠A = 80°. Find m∠B and classify ΔABC by its angle measures.



$m\angle B + 80 + 42 = 180$
$m\angle B + 122 = 180$
$m\angle B = 58°$

Acute Δ since all angles are less than 90°

2. ΔABC has m∠A = 44° and m∠B = 46°. Find m∠C and classify ΔABC by its angle measures.



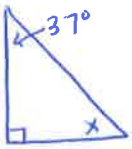
$m\angle C + 44 + 46 = 180$
$m\angle C + 90 = 180$
$m\angle C = 90°$

Right Δ since there is exactly one right angle

3. A triangle has side lengths of 4 inches, 6 inches, and 8 inches. Classify the triangle by its side lengths.

Scalene Δ since all side lengths are different

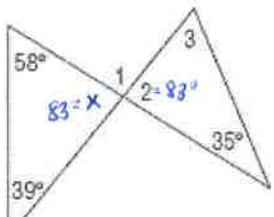
4. One acute angle of a right triangle measures 37°. Find the measure of the other acute angle.



$90 + 37 + x = 180$
$127 + x = 180$
$x = 53°$

The other angle is 53°

* 5. Using the diagram below, please find $m\angle 2$ and $m\angle 3$.



$m\angle 1 + 83 = 180$
$m\angle 1 = 97°$

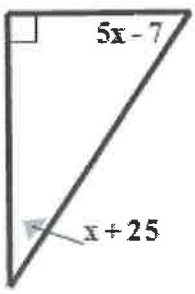
$m\angle 2 = 83°$ vertical angles

$m\angle 3 + 83 + 35 = 180$
$m\angle 3 + 118 = 180$
$m\angle 3 = 62°$

$x + 58 + 39 = 180$
$x + 97 = 180 \Rightarrow x = 83$

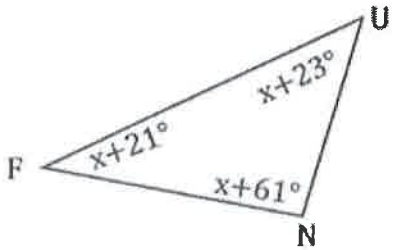
6. Using the diagrams below, please solve for x.

a.



$90 + 5x - 7 + x + 25 = 180$
$6x + 108 = 180$
$6x = 72$
$x = 12$

b.



$x + 21 + x + 23 + x + 61 = 180$
$3x + 105 = 180$
$3x = 75$
$x = 25$

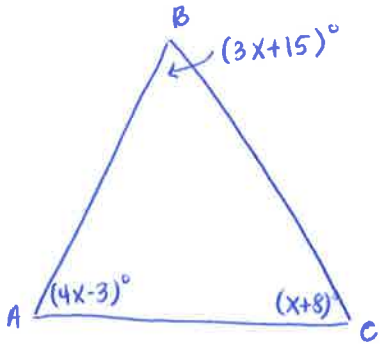
7. In ΔABC, $m\angle A=(4x-3)°$; $m\angle B=(3x+15)°$; $m\angle C=(x+8)°$. Please find the measure of each angle and classify ΔABC by its angles. *(Hint: Draw a picture. It may help.)*

a) Please solve for x.

$3x+15+4x-3+x+8=180$

$8x+20=180$

$8x=160 \Rightarrow \boxed{x=20}$



b) Please find the measure of each angle.

$m\angle A = 4(20)-3 = 77°$

$m\angle B = 3(20)+15 = 75°$

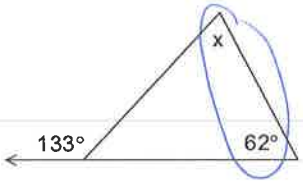
$m\angle C = 20+8 = 28°$

c) Please classify ΔABC by its angles.

Acute since all angles are less than 90°.

8. Using the diagrams below, please solve for x.

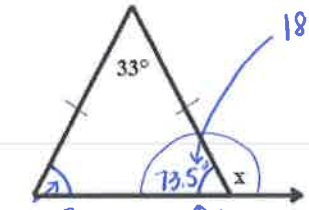
a.



$133 = x+62$

$\boxed{x=71}$

b.



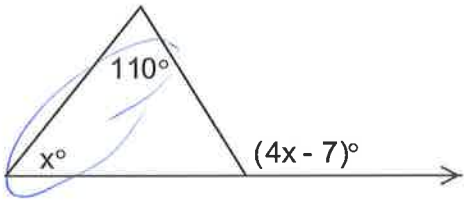
$180-33=147 \div 2 = 73.5$

↑ Linear Pair

$73.5+x=180$

$\boxed{x=106.5}$

9. Using the diagram below, please find the measure of the exterior angle.



$4x-7 = x+110$

$3x-7=110$

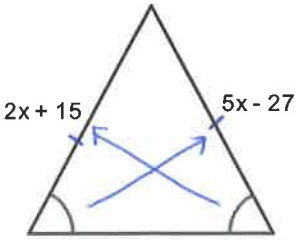
$3x=117$

$\boxed{x=39}$

Ext. angle $= 4(39)-7$

$\boxed{=149°}$

10. Using the diagram below, please find the value of x.



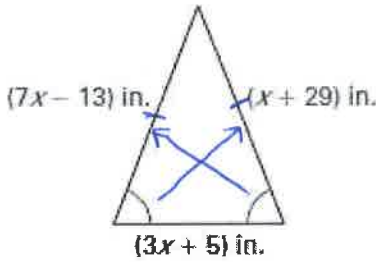
$2x+15=5x-27$

$15=3x-27$

$42=3x$

$\boxed{x=14}$

11. Using the diagram on the right, please find the length of the base.



$7x-13=x+29$

$6x-13=29$

$6x=42$

$\boxed{x=7}$

Base $= 3(7)+5$

$= \boxed{26 \text{ inches}}$

12. a) Given the diagram shown below, what can you put in the diagram to represent ∠A?

$(3x-6)^\circ$

b) What theorem justifies your conclusion from part a?

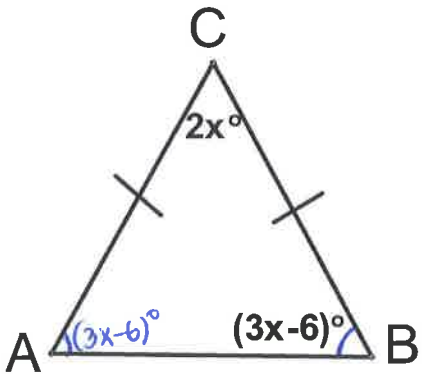
Base Angles Theorem

c) Please setup an equation and solve for x.

$2x+3x-6+3x-6=180$

$8x-12=180$

$8x=192 \Rightarrow \boxed{x=24}$



d) What theorem justifies the equation that you setup in part c?

The triangle sum theorem

e) Please find the measures of the angles in ΔABC.

$m\angle A = 3(24)-6 = 66^\circ$

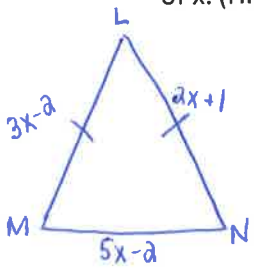
$m\angle B = 3(24)-6 = 66^\circ$

$m\angle C = 2(24) = 48^\circ$

f) Please classify the triangle by its angles.

Acute since all angles are less than 90°

13. ΔLMN is isosceles, $\overline{LM} \cong \overline{LN}$, LM = 3x – 2, LN = 2x + 1, and MN = 5x – 2. Please find the value of x. (HINT: You may want to draw a picture!)

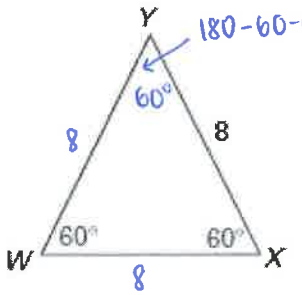


$3x-2=2x+1$

$x-2=1$

$\boxed{x=3}$

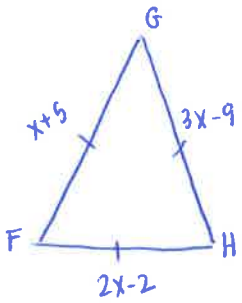
14. Using the diagram below, please find the length of $\overline{WX}$.



$180-60-60=60^\circ$

since Δ XYZ is an equiangular Δ, it is equilateral, so WX = 8 and WY = 8

15. ΔFGH is equilateral with FG = x + 5, GH = 3x – 9, and FH = 2x – 2. Find the value of x. (HINT: You may want to draw a picture!)



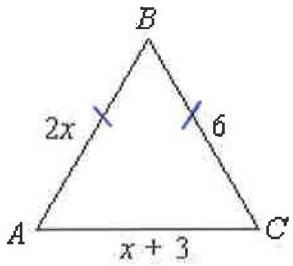
$x+5=3x-9$

$5=2x-9$

$14=2x$

$\boxed{x=7}$

16. Given that $\overline{AB} \cong \overline{BC}$, find the value of x and classify ΔABC by its angles ***and*** its sides.



$2x=6$

$\boxed{x=3}$

$AB=2(3)=6$

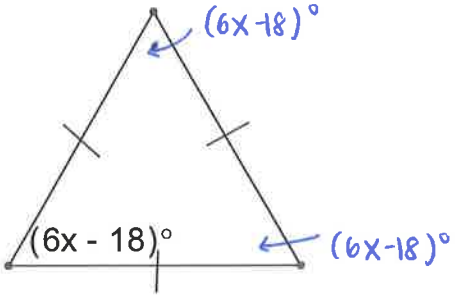
$BC=6$

$AC=3+3=6$

ΔABC is equilateral and therefore equiangular

17. Given the diagram below, please find the value of x.

Since the Δ is equilateral, it is equiangular, so all angles have a measure of $(6x-18)°$.



$6x-18+6x-18+6x-18=180$

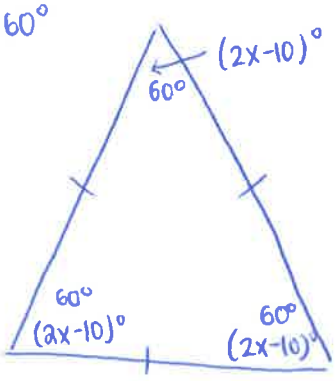
$18x-54=180$

$18x=234$

$\boxed{x=13}$

18. One angle of an equilateral triangle measures (2x – 10)°. (HINT: You may want to draw a picture)

$\frac{180}{3}=60°$



a) What is the value of *x*?

$2x-10=60$

$2x=70$

$\boxed{x=35}$

OR

$2x-10+2x-10+2x-10=180$

$6x-30=180$

$6x=210$

$\boxed{x=35}$

b) Explain how you were able to solve.

Each angle in an equilateral triangle has a measure of 60°.

A triangle has the given vertices. Graph the triangle and classify it by its side lengths. Determine if the triangle is a right triangle.

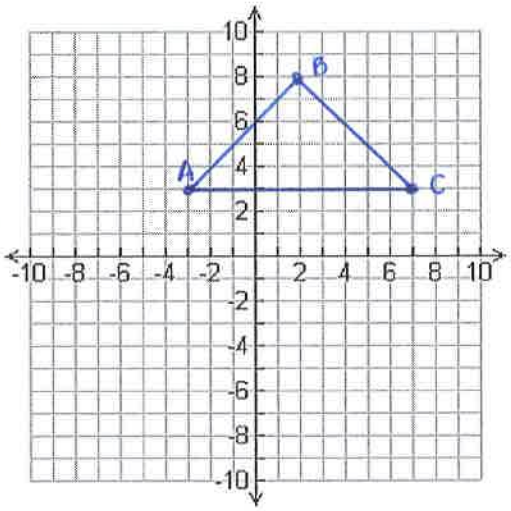
19. A(-3, 3), B(2, 8), C(7, 3)

$AB = \sqrt{(2+3)^2+(8-3)^2} = \sqrt{(5)^2+(5)^2} = \sqrt{25+25} = \sqrt{50}$

$BC = \sqrt{(7-2)^2+(3-8)^2} = \sqrt{(5)^2+(-5)^2} = \sqrt{25+25} = \sqrt{50}$

$AC = \sqrt{(7+3)^2+(3-3)^2} = \sqrt{(10)^2+(0)^2} = \sqrt{100} = 10$

} isosceles



Slope $\overline{AB} = \frac{8-3}{2+3} = \frac{5}{5} = 1$

Slope $\overline{BC} = \frac{3-8}{7-2} = \frac{-5}{5} = -1$

} $\overline{AB} \perp \overline{BC}$ so $\triangle ABC$ is a right $\triangle$.

Slope $\overline{AC} = \frac{3-3}{7+3} = \frac{0}{10} = 0$

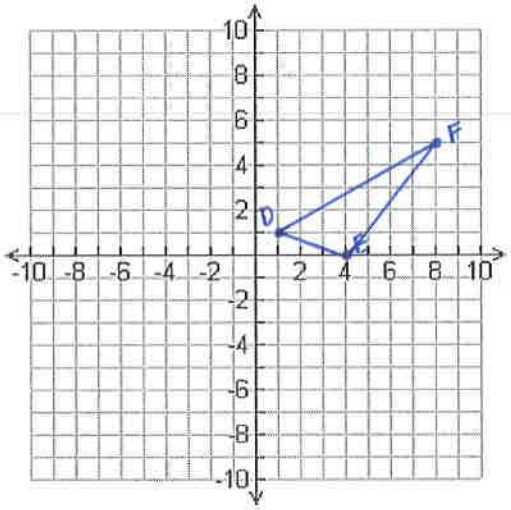
20. D(1, 1), E(4, 0) F(8, 5)

$DE = \sqrt{(4-1)^2+(0-1)^2} = \sqrt{(3)^2+(-1)^2} = \sqrt{9+1} = \sqrt{10}$

$EF = \sqrt{(8-4)^2+(5-0)^2} = \sqrt{(4)^2+(5)^2} = \sqrt{16+25} = \sqrt{41}$

$DF = \sqrt{(8-1)^2+(5-1)^2} = \sqrt{(7)^2+(4)^2} = \sqrt{49+16} = \sqrt{65}$

} scalene



Slope $\overline{DE} = \frac{0-1}{4-1} = \frac{-1}{3}$

Slope $\overline{EF} = \frac{5-0}{8-4} = \frac{5}{4}$

Slope $\overline{DF} = \frac{5-1}{8-1} = \frac{4}{7}$

} not a right $\triangle$; slopes are not opposite reciprocals

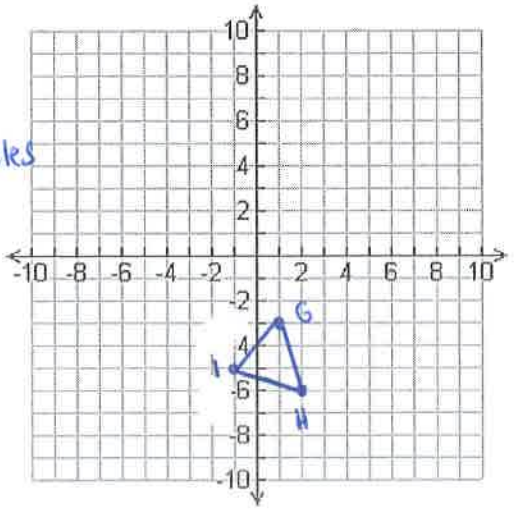
21. G(1, -3), H(2, -6), I(-1, -5)

$GH = \sqrt{(2-1)^2+(-6+3)^2} = \sqrt{(1)^2+(-3)^2} = \sqrt{1+9} = \sqrt{10}$

$HI = \sqrt{(-1-2)^2+(-5+6)^2} = \sqrt{(-3)^2+(1)^2} = \sqrt{9+1} = \sqrt{10}$

$IG = \sqrt{(-1-1)^2+(-5+3)^2} = \sqrt{(-2)^2+(-2)^2} = \sqrt{4+4} = \sqrt{8}$

} isosceles



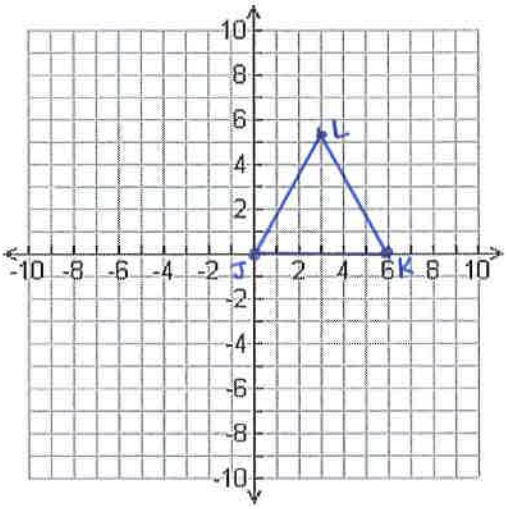
Slope $\overline{GH} = \frac{-6+3}{2-1} = \frac{-3}{1} = -3$

Slope $\overline{HI} = \frac{-5+6}{-1-2} = \frac{1}{-3}$

Slope $\overline{IG} = \frac{-5+3}{-1-1} = \frac{-2}{-2} = 1$

} not a right $\triangle$; slopes are not opposite reciprocals

22. J(0, 0), K(6, 0), L(3, $\sqrt{27}$)



$JK = \sqrt{(6-0)^2+(0)^2} = \sqrt{(6)^2} = \sqrt{36} = 6$

$JL = \sqrt{(3-0)^2+(\sqrt{27}-0)^2} = \sqrt{(3)^2+(\sqrt{27})^2} = \sqrt{9+27} = \sqrt{36} = 6$

$LK = \sqrt{(3-6)^2+(\sqrt{27}-0)^2} = \sqrt{(-3)^2+(\sqrt{27})^2} = \sqrt{9+27} = \sqrt{36} = 6$

All sides are ≅ so ΔJKL is an equilateral Δ

slope $\overline{JK} = \frac{0-0}{6-0} = \frac{0}{6} = 0$

slope $\overline{KL} = \frac{\sqrt{27}}{3-6} = \frac{\sqrt{27}}{-3}$

slope $\overline{JL} = \frac{\sqrt{27}}{3-0} = \frac{\sqrt{27}}{3}$

not a right Δ, slopes are not opposite reciprocals

ANSWER KEY :

1. m∠B = 58°, acute triangle
2. m∠C = 90°, right triangle
3. Scalene triangle
4. 53
5. $m\angle 2 = 83°$, $m\angle 3 = 62°$, $m\angle 1 = 97°$
6. a) 12 b) 25
7. a) 20 b) m∠A=77°; m∠B=75°; m∠C=28° c) acute
8. a) 71 b) 106.5
9. 149°
10. x = 14
11. 26 inches
12. a) $(3x-6)°$ b) Base Angles Theorem c) x=24 d) Triangle Sum Theorem e) $66°, 66°, 48°$ f) Acute
13. x = 3
14. WX = 8 units
15. x = 7
16. x = 3, equilateral/equiangular triangle
17. x = 13, 35°
18. a) 65, b) Corollary to the Base Angles Theorem
19. Isosceles, right triangle
20. Scalene, not a right triangle
21. Isosceles, not a right triangle
22. Equilateral, not a right triangle