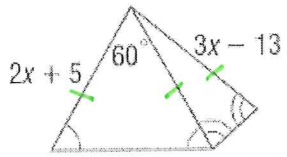
Name: Key Date: _____ Hour: _____

Isosceles and Equilateral Triangles- Homework

Directions: Show all work to find x. Circle your final answer.

1.



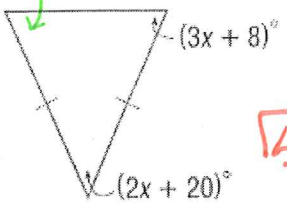
Base ∠s ≅ then it is an isosc △.

$2x+5 = 3x-13$

$\boxed{x = 18}$

2.

base ∠s of isosc △ are ≅



△ sum

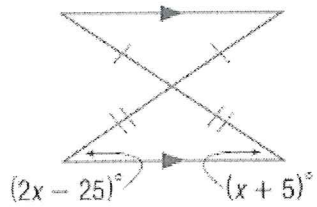
$3x+8+3x+8+2x+20 = 180$

$8x+36 = 180$

$8x = 144$

$\boxed{x = 18}$

3.

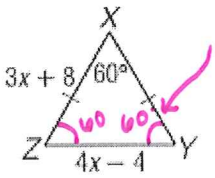


base ∠s of isosc △s are ≅

$2x-25 = x+5$

$\boxed{30 = x}$

4.



$180-60 = 120 \div 2$

b/c base ∠s of isosc △ ≅ so $\angle Z = \angle Y = 60°$

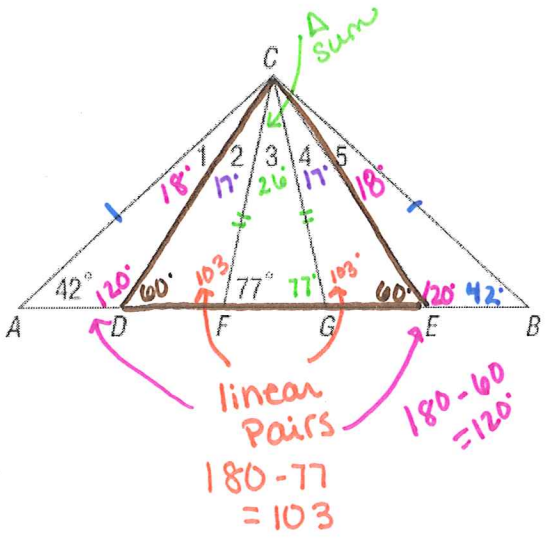
∴ △XYZ is equilateral.

$XZ = ZY$

$3x+8 = 4x-4$

$\boxed{12 = x}$

5. **CHALLENGE** In the figure, $\triangle ABC$ is isosceles, $\triangle DCE$ is equilateral, and $\triangle FCG$ is isosceles. Find the measures of the five numbered angles at vertex C.



180 − 77 = 103

m∠1 = 18°

m∠2 = 17°

m∠3 = 26°

m∠4 = 17°

m∠5 = 18°

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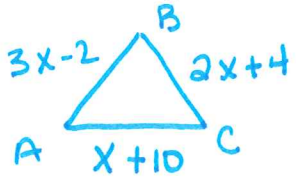
Reading the question: Draw your figure before you solve. Find x and the measure of each side of the triangle.

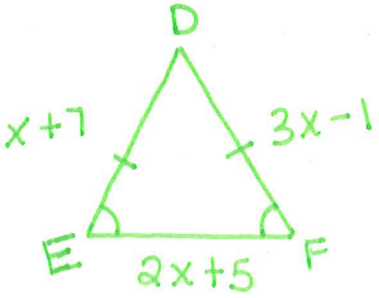
6. $\triangle ABC$ is equilateral with $AB = 3x - 2$, $BC = 2x + 4$, and $CA = x + 10$.



$BC = AC$
$2x + 4 = x + 10$
$\boxed{x = 6}$
def of eq. $\triangle$

$AB = 16$
$BC = 16$
$AC = 16$

7. $\triangle DEF$ is isosceles, $\angle D$ is the vertex angle, $DE = x + 7$, $DF = 3x - 1$, and $EF = 2x + 5$.



$ED = DF$ def of isos. $\triangle$
$x + 7 = 3x - 1$
$8 = 2x$
$\boxed{4 = x}$

$DE = 11$
$DF = 11$
$EF = 13$

Find the measures of the sides of $\triangle RST$ and classify each triangle by its sides.

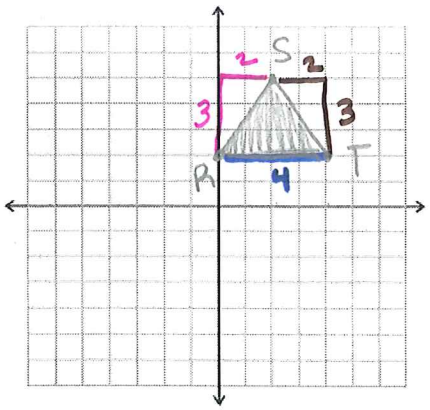
8. $R(0, 2), S(2, 5), T(4, 2)$

$SR^2 = 3^2 + 2^2$
$\boxed{SR = \sqrt{13}}$

$ST^2 = 2^2 + 3^2$
$\boxed{ST = \sqrt{13}}$

$\boxed{RT = 4}$

$SR \cong ST$ so $\triangle RST$ is isosceles by def.



9. $R(1, 3), S(4, 7), T(5, 4)$

$SR^2 = 3^2 + 4^2$
$SR = \sqrt{25}$
$\boxed{SR = 5}$

$RT^2 = 1^2 + 4^2$
$\boxed{RT = \sqrt{17}}$

$ST^2 = 1^2 + 3^2$
$\boxed{ST = \sqrt{10}}$

None are $\cong$ $\therefore$ by def. $\triangle RST$ is scalene