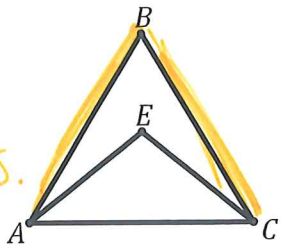
Isosceles and Equilateral Triangles Practice Worksheet

Name: Key

1. Use the diagram to complete each statement:



a. If $\overline{AB} \cong \overline{BC}$, then which two angles are congruent?

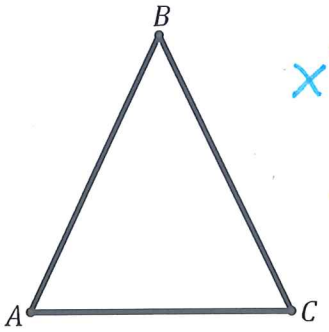
$\angle BAC \cong \angle BCA$ base $\angle$s of isos. $\triangle$s are $\cong$

b. If $< EAC \cong < ECA$, then which two sides are congruent?

$\overline{AE} \cong \overline{CE}$ If base $\angle$s are $\cong$ then sides (legs) op. are $\cong$

#2 -5: Use factoring to find the value(s) of x if possible.

2. ΔABC is isosceles with legs $AB = x^2 + 4x$ and $BC = -4x - 7$.



$\overline{AB} \cong \overline{BC}$ def of isosceles

$x^2 + 4x = -4x - 7$

$x^2 + 8x + 7 = 0$

$(x+7)(x+1) = 0$

$x = -7 \quad x = -1$

$AB = 21$ and $BC = 21$ But distance can't be neg. $\therefore$ $x = -7$ only

Check $x = -7$

$AB = (-7)^2 + 4(-7)$

$AB = 49 - 28$

$AB = 21$ ✓

$BC = -4(-7) - 7$

$BC = 21$ ✓

Check $x = -1$

$AB = (-1)^2 + 4(-1)$ $AB = -3$

$BC = -4(-1) - 7$ $BC = -3$

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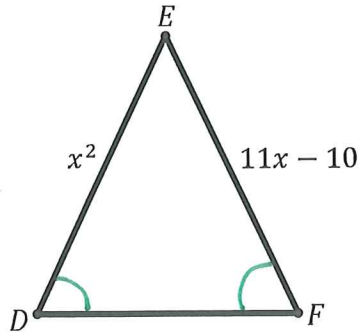
3. Given: $< D \cong < F$



If base $\angle$s are $\cong$ then op. legs are $\cong$ $\therefore$

$\overline{DE} \cong \overline{EF}$

$x^2 = 11x - 10$

$x^2 - 11x + 10 = 0$

$(x-10)(x-1) = 0$

$x = 10 \quad x = 1$

Check $x = 10$

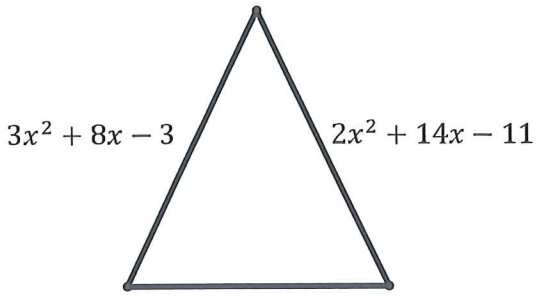
$EF = 100$ ✓

$DE = 100$

Check $x = 1$

$ED = 1$, $EF = 1$ ✓

4.



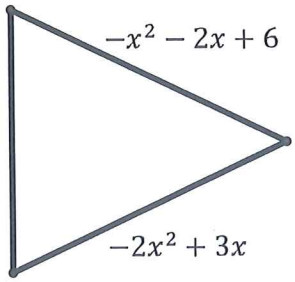
$3x^2+8x-3 = 2x^2+14x-11$

$x^2-6x+8=0$

$(x-4)(x-2)=0$

$\boxed{x=4}$ $\boxed{x=2}$ ✓

5.



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

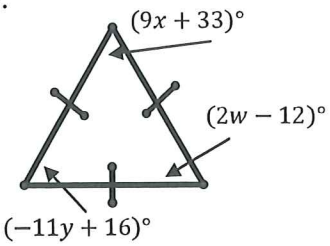
$x^2-5x+6=0$

$(x-3)(x-2)=0$

$\boxed{x=2}$ $\boxed{x=3}$

#6 - : Use properties of equilateral and isosceles triangles to solve.

6.



Equilateral is equiangular

$\therefore$ each $< = 60°$

$9x+33=60$

$\boxed{x=3}$

$2w-12=60$

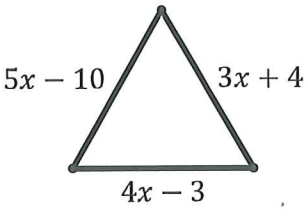
$\boxed{w=36}$

$-11y+16=60$

$-11y=44$

$\boxed{y=-4}$

7. Given: The triangle is equilateral.

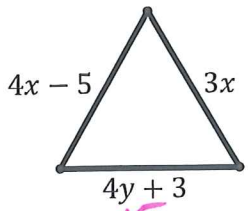


$5x-10=3x+4$

$2x=14$

$\boxed{x=7}$

8.



15

15

$3x = 4x - 5$

$-x = -5$

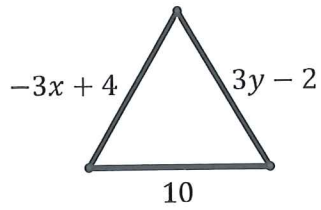
$\boxed{x = 5}$

$4y + 3 = 15$

$4y = 12$

$\boxed{y = 3}$

9.



$-3x + 4 = 10$

$-3x = 6$

$\boxed{x = -2}$

$3y - 2 = 10$

$3y = 12$

$\boxed{y = 4}$

Answers: