

Name

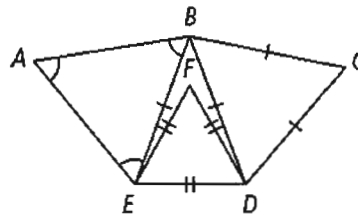
ANSWERS

Date

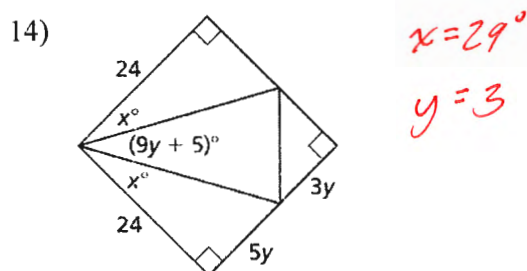
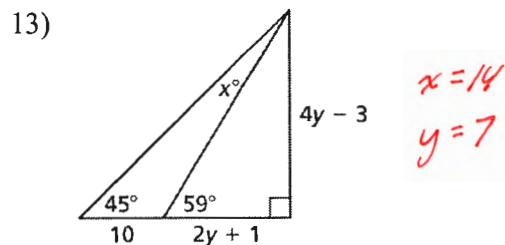
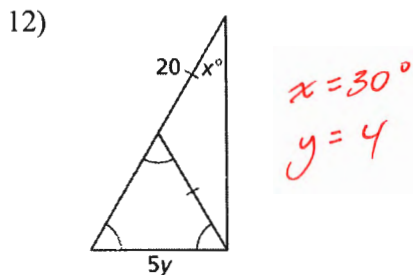
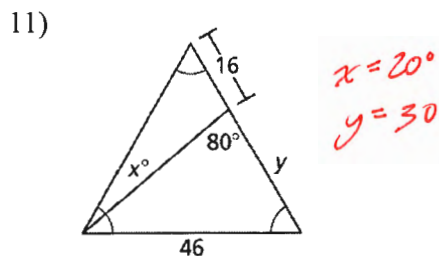
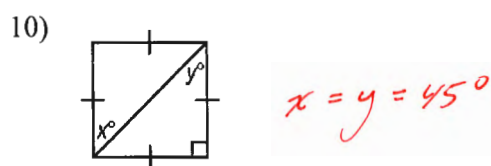
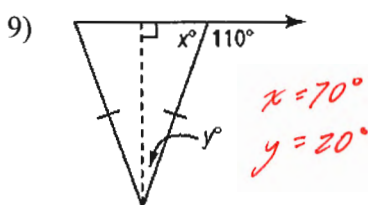
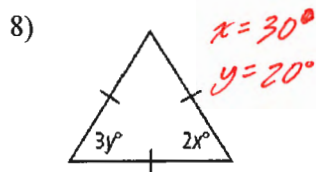
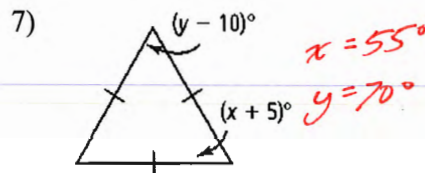
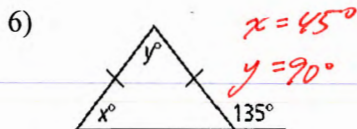
4.5 – Isosceles and Equilateral Triangles

Complete each statement. Explain briefly why it is true.

- 1) $\angle DBC \cong \angle BCD \cong \angle CDB$ All $\angle$ s in an eq. Δ are $\cong$
- 2) $\angle BED \cong \angle BDE$ Converse Iso Δ Th.
- 3) $\angle FED \cong \angle EDF \cong \angle DFE$ All $\angle$ s in an eq. Δ are $\cong$
- 4) $\overline{AB} \cong \overline{EA} \cong \overline{BE}$ All sides in an eq. Δ are $\cong$

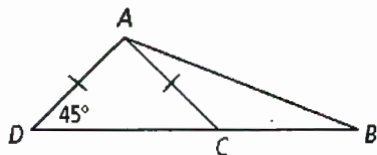


Find the value of x and y .

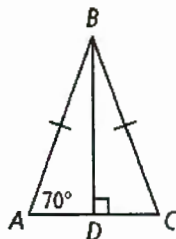


Use the properties of isosceles and equilateral triangles to find the measure of the indicated angle.

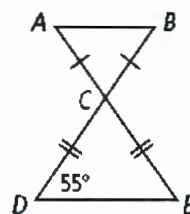
15) $m\angle ACB = \underline{135^\circ}$



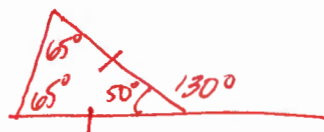
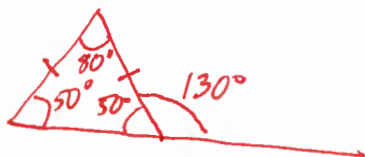
16) $m\angle DBC = \underline{20^\circ}$



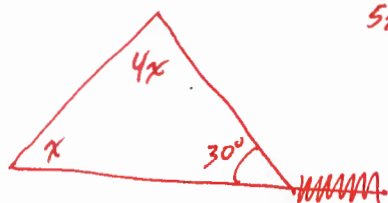
17) $m\angle ABC = \underline{55^\circ}$



- 18) An exterior angle of an isosceles triangle has the measure 130. Find two possible sets of measures for the angles of the triangle.



- 19) The measure of one angle of a triangle is 30° . Of the two remaining angles, the larger angle is four times the size of the smaller angle. Is the triangle isosceles? Explain.



$$\begin{aligned} 5x + 30 &= 180 \\ 5x &= 150 \\ x &= 30^\circ \end{aligned}$$

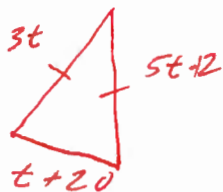
Yes, the base angles are congruent

- 20) Are isosceles triangles always acute triangles? Explain your reasoning.



No. They can also be obtuse, just as long as you have congruent sides.

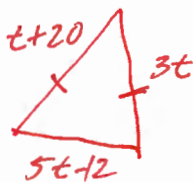
- 21) The lengths of the sides of a triangle are $3t$, $5t - 12$, and $t + 20$. Find the values of t that make the triangle isosceles. Explain your reasoning.



$$3t = 5t - 12$$

$$12 = 2t$$

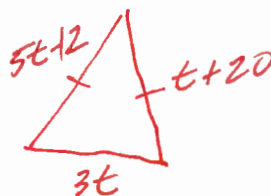
$$\boxed{6 = t}$$



$$t + 20 = 3t$$

$$20 = 2t$$

$$\boxed{10 = t}$$



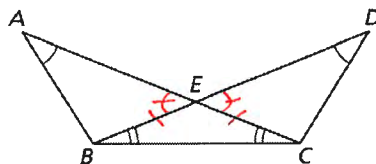
$$5t - 12 = t + 20$$

$$4t = 32$$

$$\boxed{t = 8}$$

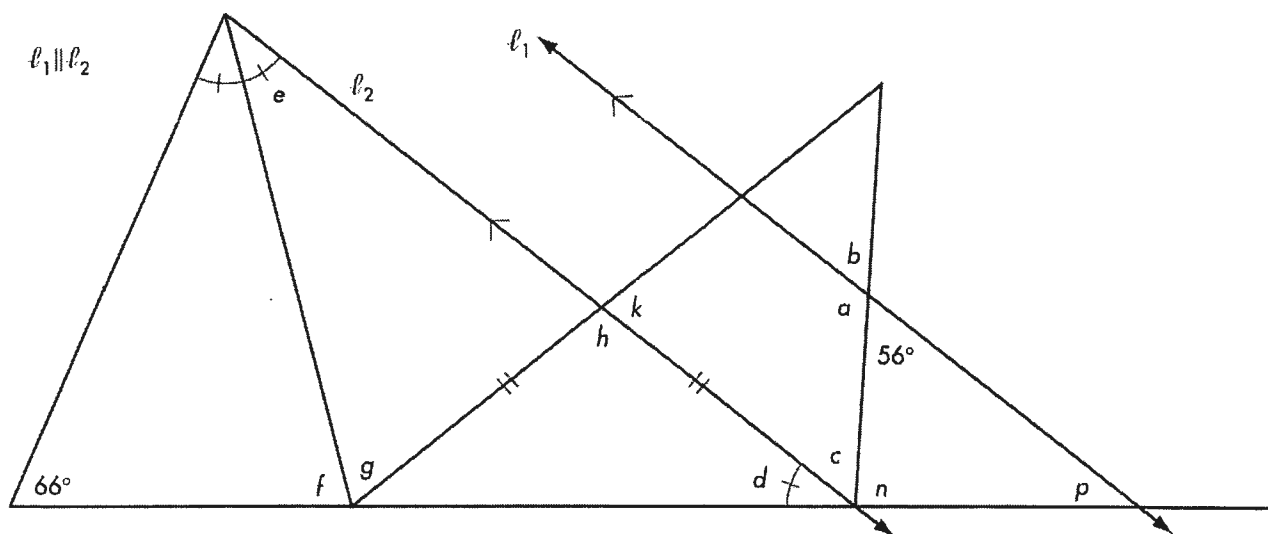
- 22) Given: $\angle BAE \cong \angle CDE$
 $\angle EBC \cong \angle ECB$

Prove: $\overline{AB} \cong \overline{DC}$



Statement	Reasons
$\angle BAE \cong \angle CDE$	Given
$\angle EBC \cong \angle ECB$	Given Base Angles
$\overline{BE} \cong \overline{CE}$	Conv. V.A. Theorem
$\angle AEB \cong \angle DEC$	VA
$\triangle AEB \cong \triangle DEC$	AAS
$\overline{AB} \cong \overline{DC}$	C.P.C.T.C

- 23) Calculate each lettered angle below.



$a = 124^\circ$ $d = 38^\circ$ $g = 66^\circ$ $n = 86^\circ$
 $b = 56^\circ$ $e = 38^\circ$ $h = 104^\circ$ $p = 38^\circ$
 $c = 56^\circ$ $f = 76^\circ$ $k = 76^\circ$