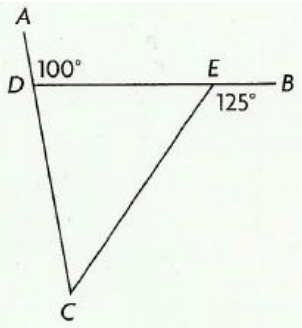
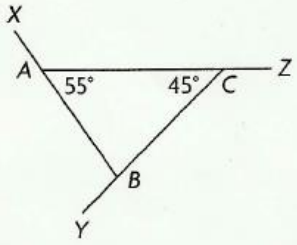
Worksheet – Angle Properties in Triangles

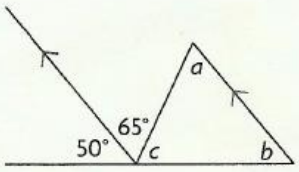
1. Determine the measures of the interior angles of $\triangle CDE$.



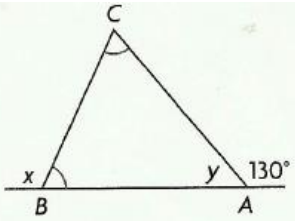
2. Determine the measures of $\angle XAZ$, $\angle YBX$, and $\angle YCZ$.



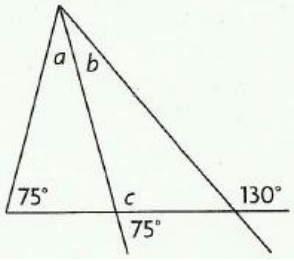
3. Determine the angles a, b, c.



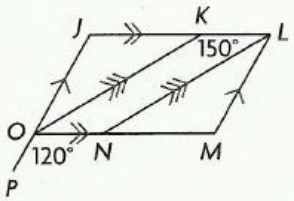
4. Triangle ABC is isosceles, with $AB = AC$. Determine the measures of angles x and y.



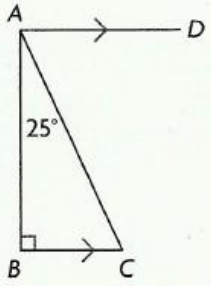
5. Determine the measures of angles a, b, and c.



6. Determine the measures of $\angle OJK$, $\angle JKO$, and $\angle JOK$.

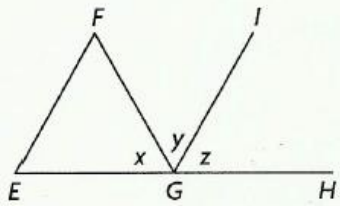


7. Determine the measure of $\angle DAC$. Show your work.



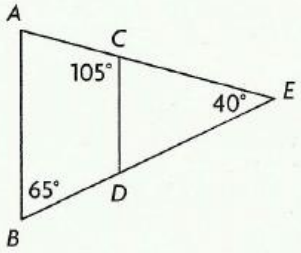
8. In $\triangle EFG$, GI bisects $\angle FGH$.

a) If $\angle E = \angle y$, then prove that $EF \parallel GI$.



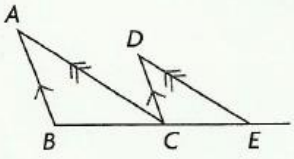
b) If $\angle F = \angle z$, then prove that $EF \parallel GI$.

9. Prove that $AB \parallel CD$.



10. Determine the measures of the exterior angles of an isosceles triangle where the non-base angle is 70°. Explain your reasoning and include a diagram.

11. Prove that $\triangle ABC$ is similar to $\triangle DCE$.



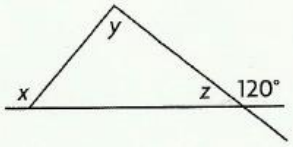
12. With which set of properties can you solve for angles x, y, and z?

A. supplementary angles, exterior angle, sum of angles in triangle

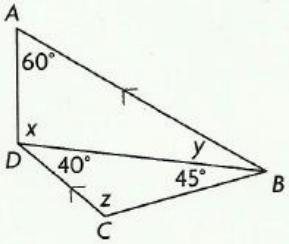
B. supplementary angles, alternate interior angles, sum of angles in triangle

C. supplementary angles, corresponding angles, exterior angle

D. none of these choices



13. Determine the measures of angles in trapezoid $ABCD$.



ANSWERS:

1. $\angle DCE = 45°, \angle CDE = 80°, \angle CED = 55°$

2. $\angle XAZ = 125^o,\ \angle YBX = 100^o,\ \angle YCZ = 135^o$

3. $\angle a = 65^o,\ \angle b = 50^o,\ \angle c = 65^o$

4. $\angle x = 115°, \angle y = 50°$
5. $\angle a = 30°, \angle b = 25°, \angle c = 105°$
6. $\angle OJK = 120°, \angle JKO = 30°$, and $\angle JOK = 30°$
7. $\angle DAC = 65°$

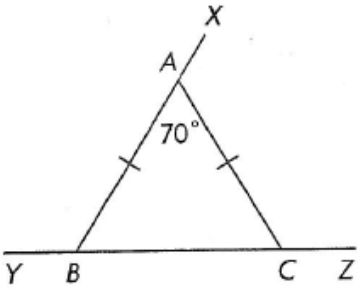
8 a.

$\angle E = \angle y$	given
GI bisects $\angle FGH$	given
$\angle z = \angle y$	definition of bisect
$\angle E = \angle z$	transitive property
$\therefore EF \parallel GI$	corresponding angles are equal

	$\angle F = \angle z$	given
	GI bisects $\angle FGH$	given
8 b.	$\angle y = \angle z$	definition of bisect
	$\angle F = \angle y$	transitive property
	$\therefore EF \parallel GI$	alternate interior angles are equal

	$\angle A = 75^o$	angle sum of a triangle = 180^o
9.	$\angle A + \angle ACD = 180^o$	angle addition
	$\therefore AB \parallel CD$	co-interior angles are supplementary

	$\angle XAC = 110^o$	supplementary angles
	$\angle ABC = \angle ACB$	base angles in an isosceles triangle are equal
10.	$\angle ABC = \angle ACB = 55^o$	angle sum of a triangle = 180^o
	$\angle ABY = 125^o$	supplementary angles
	$\angle ACZ = 125^o$	supplementary angles



	$AB \parallel DC$	given
	$\angle ABC = \angle DCE$	corresponding angles
	$AC \parallel DE$	given
11.	$\angle ACB = \angle DEC$	corresponding angles
	$\angle BAC = \angle ACD$	alternate interior angles
	$\angle CDE = \angle ACD$	alternate interior angles
	$\angle BAC = \angle CDE$	transitive property
	$\therefore \Delta ABC \sim \Delta DCE$	all three pairs of corresponding angles are congruent

12. D

13. $\angle x = 80^o,\ \angle y = 40^o,\ \angle z = 95^o$