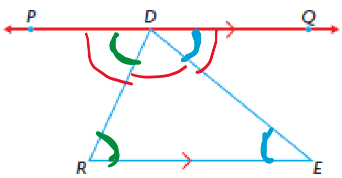
2.3: Angles and Triangles

Can we prove that the sum of the measures of the interior angles of any triangle is 180° ?



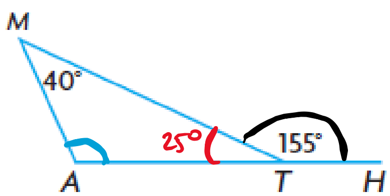
$\angle PDR = \angle DRE$ alt. int. ∠s

$\angle QDE = \angle RED$ alt. int ∠s

$\angle PDR + \angle QDE + \angle RDE = 180°$ angles on a line

$\angle DRE + \angle RED + \angle RDE = 180$ transitive property

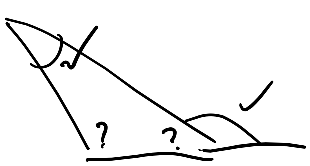
Example 1:
In the diagram, ∠MTH is an exterior angle of ΔMAT. Determine the measures of the unknown angles in ΔMAT.



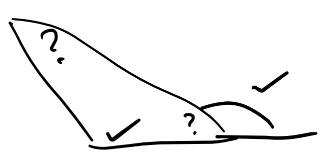
$\angle MTA = 25°$ supp ∠s

$\angle MAT = 115°$ $(180 - 40 - 25)$ ∠s in a Δ

If you are given one interior and one exterior angle of a triangle, can you ALWAYS determine the other interior angles of the triangle? Explain with words and diagrams.



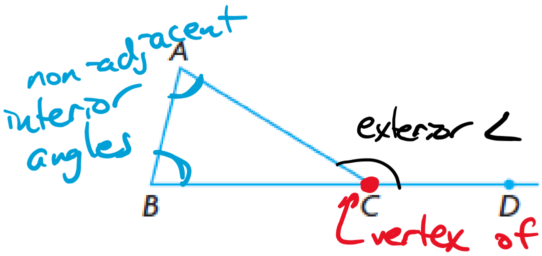
can find the other 2



Can find the other 2

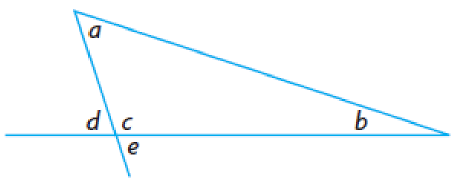
No, can't solve for the other 2

Non-adjacent interior angles: Two angles of a $\triangle$ that do not have the same vertex as an exterior angle.



Example 2:

Prove ∠e = ∠a + ∠b



$\angle e + \angle c = 180^\circ$ supplementary

$\angle a + \angle b + \angle c = 180^\circ$ ∠s in a $\triangle$

$\angle e = 180^\circ - \angle c$

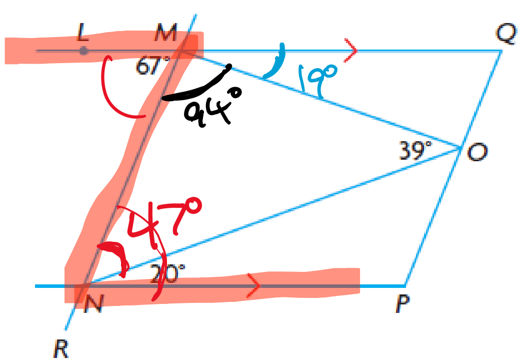
$\angle a + \angle b = 180^\circ - \angle c$

$\angle e = \angle a + \angle b$ transitive property

Example 3:

Determine the measure of

∠NMO, ∠MNO, and ∠QMO.



$\angle MNO = 47^\circ$ alt. int. ∠s

$\angle NMO = 94^\circ$ ∠'s in a $\triangle$

$\angle QMO = 19^\circ$ ∠'s on a line

THINGS TO REMEMBER:

Can be used as reasons

Isosceles $\triangle$ = 2 equal angles, 2 equal sides

Equilateral $\triangle$ = 3 equal sides and angles (60°)

Right $\triangle$ = 1 right angle (90°)

P 90 1-7, 9, 11, 14, 15, Triangle w/s