

7.1 Angles in Triangles HW

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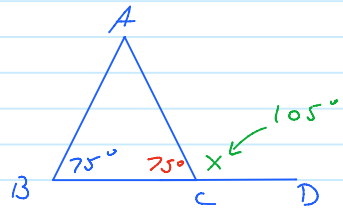
pg 371 # 1a, 2a, 3, 4, 5, 6, 8, 9, 10

1. a) $w = 85 + 30$
 $= 115^\circ$

2. a) $x + 165 + 155 = 360$
 $x + 320 = 360$
 $x = 360 - 320$
 $x = 40^\circ$

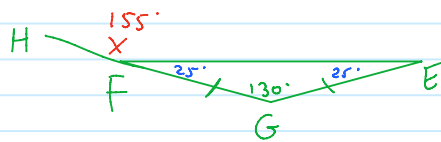
3. let unknown angle be x
 $x + 70 + 120 = 360$
 $x + 190 = 360$
 $x = 360 - 190$
 $x = 170^\circ$

4. a) Since it's isosceles, we know that $\angle ABC = \angle ACB$
 so $\angle ACB = 75^\circ$
 $\angle ACB + x = 180^\circ$ (straight line)
 $75 + x = 180^\circ$
 $x = 180 - 75$
 $x = 105^\circ$



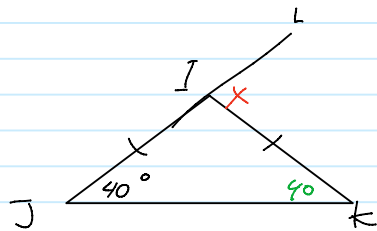
b) $\triangle FEG$ is isosceles, so $\angle GFE = \angle GEF$

$\angle GFE + \angle GEF + 130 = 180$
 $\angle GFE + \angle GEF = 180 - 130$
 $\angle GFE + \angle GEF = 50$
 since $\angle GFE = \angle GEF$, they must each be 25°

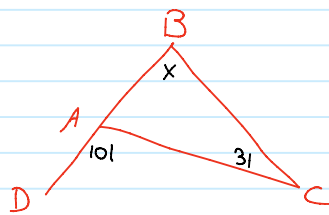


$x + 25 = 180$ (straight line)
 $x = 180 - 25$
 $x = 155$

c) $\angle JKL = 40^\circ$ (isosceles)
 $x = 40^\circ + 40^\circ$ (exterior rule)
 $x = 80^\circ$



5. a) exterior angle $DAC = \text{interior } \angle ABC + \angle BCA$
 $101 = x + 31$
 $101 - 31 = x$
 $70 = x$



b) $x + 65 = 180$ (straight line) $y + 34 = 180$ (straight line)
 $x = 180 - 65$ $y = 180 - 34$
 $x = 115^\circ$ $y = 146^\circ$

$z + 65^\circ + 34^\circ = 180$ (interior of triangle)
 $z + 99 = 180$
 $z = 180 - 99$
 $z = 81^\circ$

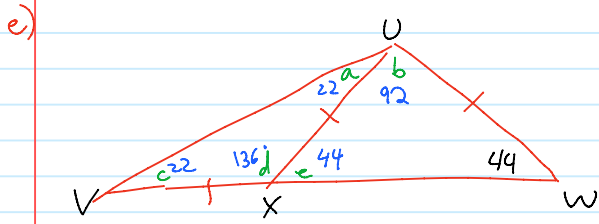
c) Isosceles, so $w = y$ and $w + y + 94 = 180$ (sum of angles in triangle)
 $w + y = 180 - 94$
 $w + y = 86$
 w and y must both be 43°

$x = 94 + 43$ $z = 43 + 94$ (ext angle = sum of the other two interiors)
 $= 137^\circ$ $= 137^\circ$

d) Isosceles, so $y = 44$. $44 + 44 + w = 180^\circ$ (sum of angles in triangle)
 $88 + w = 180$

d) Isosceles, so $y = 44$. $44 + 44 + w = 180^\circ$ (sum of angles in triangle)
 $88 + w = 180$
 $w = 180 - 88$
 $w = 92^\circ$

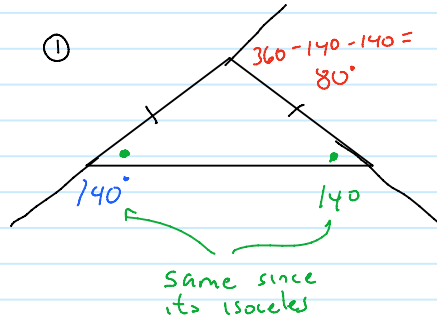
$x + 44 = 180$ (straight line) $z + 44 = 180$ (straight line)
 $x = 180 - 44$ $z = 180 - 44$
 $x = 136$ $z = 136$



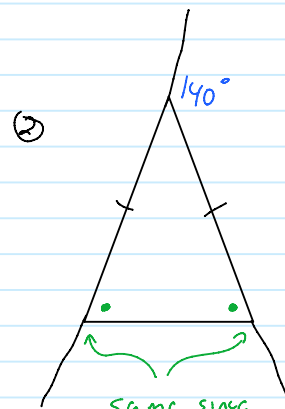
e is 44° (isosceles rule)
 b is $180 - 44 - 44 = 92$ (triangle sum rule)
 d is $92 + 44 = 136$ (exterior rule)
 $c = a$ (isosceles rule)
 $c + a + 136 = 180$ (triangle sum rule)
 $c + a = 180 - 136$
 $c + a = 44$
 so c and a each = 22°

6. one exterior of an isosceles is 140° . Find the possible measures of the other two exterior angles.

We can sketch two possibilities:



In this option the exterior angles are $140^\circ, 140^\circ, 80^\circ$



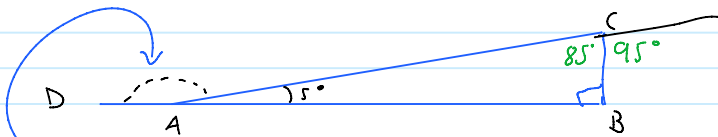
In this option the exterior angles are $140^\circ, 110^\circ, 110^\circ$

8. Isosceles triangles have two exterior angles equal
 Equilateral triangles have three exterior angles equal

9 a) An obtuse angle is an angle greater than 90° . So, two obtuse angles would have a sum greater than 180° . Since a triangle must have three angles with a sum of 180° , it is impossible for two of them to be obtuse!

b) Yes, a triangle can have three obtuse angles. Three angles greater than 90° can have a sum of 360° (ex $120, 120, 120$)

10.



a) $\angle DAC = 180 - 5$
 $= 175^\circ$ (straight line rule)

b) $\angle ACB = 180 - 90 - 5$ (sum of angles in a triangle)
 $= 85^\circ$

Its exterior angle is $180 - 85 = 95^\circ$
 (straight line)