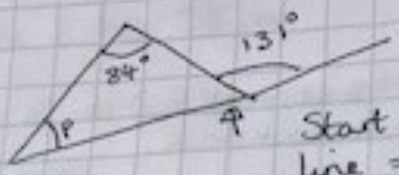
3. a)

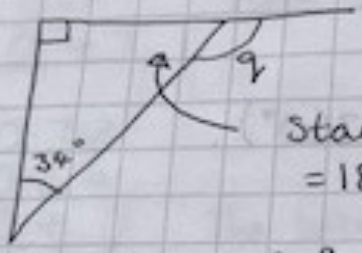


Start here, angles on a straight line = 180°.
So this angle is 49°.

Then angles in a triangle = 180°.

$84° + 49° + p = 180°$. $p = 47°$

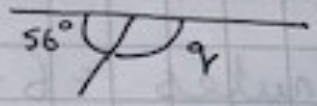
b)



Start here, angles in a triangle = 180°.

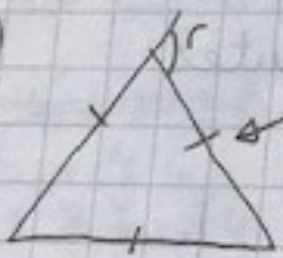
$90° + 34° + ? = 180°$ $? = 56°$

Angles on a straight line = 180°.

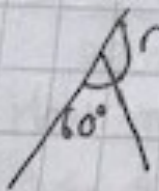


$56° + q° = 180°$. $q = 124°$

c)



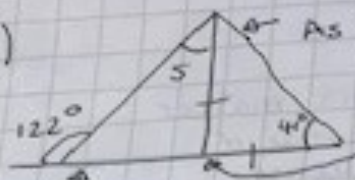
I know that this means the sides are the same length. It is an equilateral triangle so all angles are 60° ($180° \div 3 = 60°$).



Angles on a straight line = 180°

$60° + r° = 180°$. $r = 120°$

d)



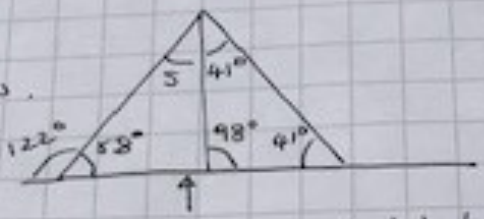
As it is an isosceles, this must also be 41°.

Angles in a triangle = 180°.

So ? → 41° + 41° + ? = 180° ? = 98°

Angles on a straight line = 180°, so this must be 58°.

So now we know.



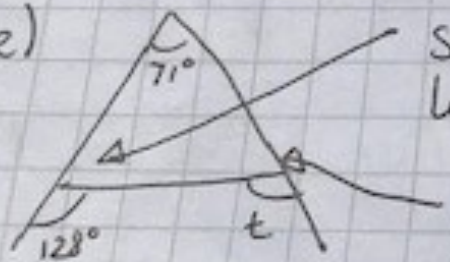
Angles on a straight line = 180°.

So ? + 98° = 180°. ? = 82°.

Angles in a triangle = 180°.

58° + 82° + s = 180° s = 40°.

e)

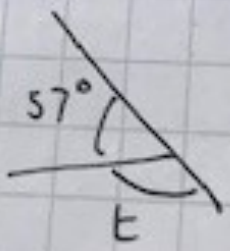


Start here, angles in a straight line = 180°. So this is 52°.

Now here, angles in a triangle = 180°.

71° + 52° + ? = 180° ? = 57°.

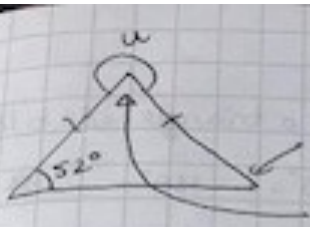
Now for t.



Angles on a straight line = 180°.

So t = 123°.

f)



It is an isosceles, so I know this angle is also 52°.

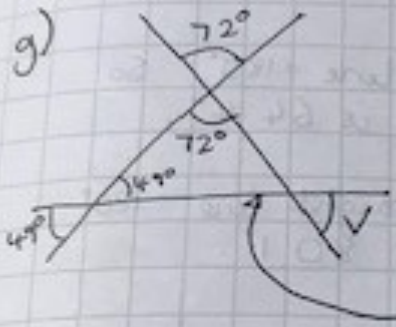
Angles in a triangle = 360°.

$52° + 52° + ? = 180°$. $? = 76°$.

Angles at a point = 360°.

$76° + u = 360°$. $u = 284°$

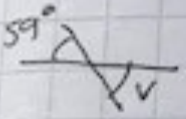
g)



I can fill in the 2 inside angles of the triangle because they are vertically opposite the others.

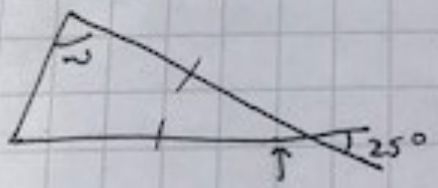
Angles in a triangle = 180°.

$49° + 72° + ? = 180°$ $? = 59°$.



Vertically opposite angles. $v = 59°$

h)



25° because it's vertically opposite.

Isosceles triangle so z and the other unknown angle are the same size.

$25° + z + ? = 180°$. z and ? are equal.

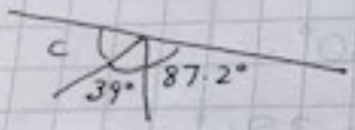
$z = 77.5°$.

4. a)

Angles in a triangle add to 180°.

$70.5° + 70.5° + ? = 180°$ $? = 39°$

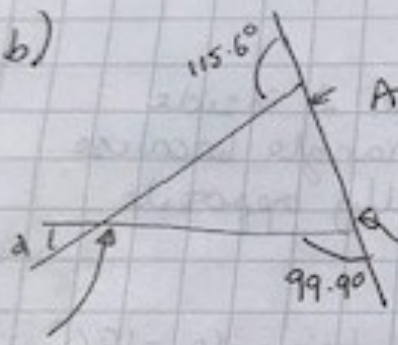
Also 70.5° as an isosceles.



Angles on a straight line = 180°.

$c + 39 + 87.2° = 180°$. $c = 53.8°$.

b)



Angles on a straight line = 180°. So this angle is 64.4°.

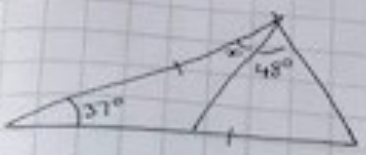
Angles on a straight line = 180°. So this angle = 80.1°.

Angles in a triangle = 180°.

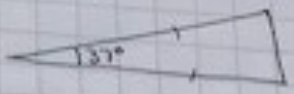
$64.4° + 80.1° + ? = 180°$ $? = 35.5°$.

d is vertically opposite to this, so is also 35.5°.

5.



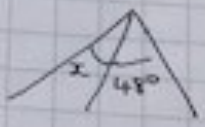
Just imagine the isosceles triangle:



To work out the other 2 angles:

$37° + ? + ? = 180°$. $? = 71.5°$.

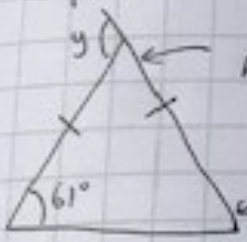
Now imagine the top corner:



We know the total of this corner is $71.5°$.

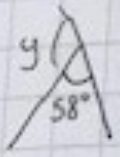
So $48° + x = 71.5°$. $x = 23.5°$.

6. Option 1



Angles in a triangle = 180°. $61° + 61° + ? = 180°$.
$? = 58°$.

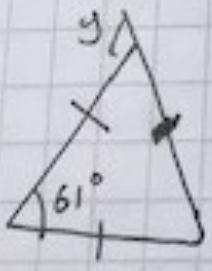
← This angle is also 61°.



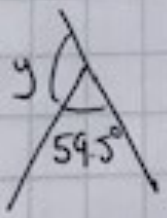
Angles in a straight line = 180°.

$58° + y = 180°$. $y = 122°$.

Option 2



$61° + ? + ? = 180°$. $? = 59.5°$.



Angles in a straight line = 180°.

$59.5° + y = 180°$. $y = 120.5°$