



The National
Orthodox School
Shmaisani



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Answer
key

Subject: Mathematics

Second Semester

Name:

Grade 6 CS

Unit (8): Gemoerty

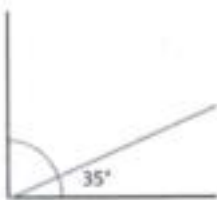
Worksheet (4)

Angles to 90° (complementary angles)

Remember that the right angle is equal to 90°

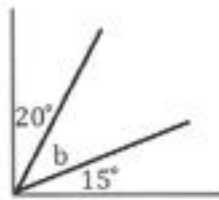
Exercise (1): Work out the missing angles (the first one has been done for you)

1)



$$90 - 35 = 55$$

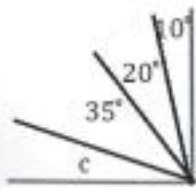
2)



$$20^\circ + 15^\circ = 35^\circ$$

$$\therefore b = 90^\circ - 35^\circ = 55^\circ$$

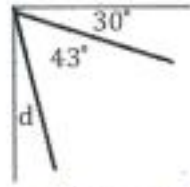
3)



$$10^\circ + 20^\circ + 35^\circ = 65^\circ$$

$$\therefore c = 90^\circ - 65^\circ = 25^\circ$$

4)



$$43^\circ + 30^\circ = 73^\circ$$

$$\therefore d = 90^\circ - 73^\circ = 17^\circ$$



Angles on a straight line 180° (supplementary angles)

Remember that the straight angle is equal to 180°

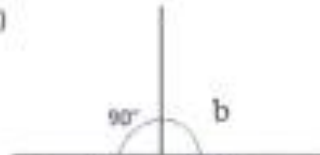
Exercise (2): Work out the missing angles (the first one has been done for you)

1)



$$180 - 50 = 130$$

2)



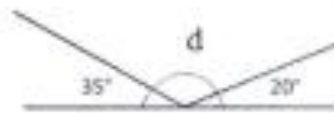
$$\angle b = 90^\circ$$

3)



$$\begin{aligned} \angle c &= 180^\circ - 35^\circ \\ &= 145^\circ \end{aligned}$$

4)



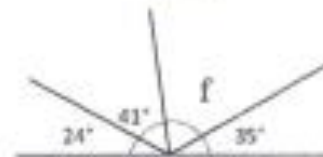
$$\begin{aligned} 35^\circ + 20^\circ &= 55^\circ \\ \angle d &= 180^\circ - 55^\circ \\ &= 125^\circ \end{aligned}$$

5)



$$\begin{aligned} 90^\circ + 67^\circ &= 157^\circ \\ \angle e &= 180 - 157^\circ \\ &= 23^\circ \end{aligned}$$

6)



$$\begin{aligned} 41^\circ + 24^\circ + 35^\circ &= 100^\circ \\ \angle f &= 180^\circ - 100^\circ \\ &= 80^\circ \end{aligned}$$

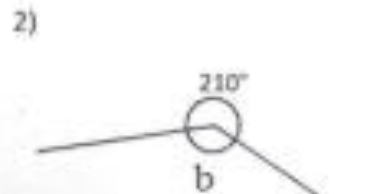
Angles around a point

Remember that the angles around the point add up to 360°

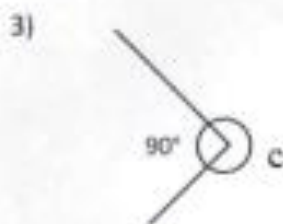
Exercise (3): Work out the missing angles (the first one has been done for you)



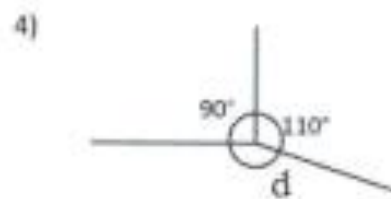
$$360 - 260 = 100$$



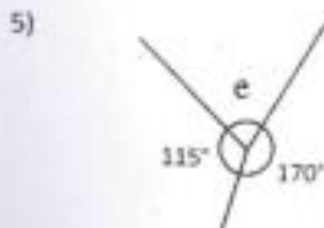
$$\begin{aligned} \angle b &= 360^\circ - 210^\circ \\ &= 150^\circ \end{aligned}$$



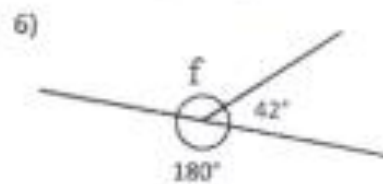
$$\begin{aligned} \angle c &= 360^\circ - 90^\circ \\ &= 270^\circ \end{aligned}$$



$$\begin{aligned} 90^\circ + 110^\circ &= 200^\circ \\ \angle d &= 360^\circ - 200^\circ \\ &= 160^\circ \end{aligned}$$



$$\begin{aligned} 115^\circ + 170^\circ &= 285^\circ \\ \angle e &= 360^\circ - 285^\circ \\ &= 75^\circ \end{aligned}$$



$$\begin{aligned} 42^\circ + 180^\circ &= 222^\circ \\ \angle f &= 360^\circ - 222^\circ \\ &= 138^\circ \end{aligned}$$

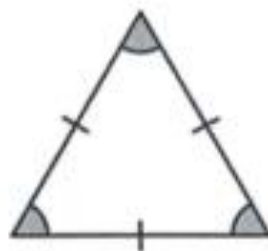
Angles in a triangle.

Remember that the angles in a triangle add up to 180°

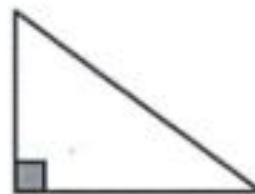
The types of triangles:



Isosceles



Equilateral



Right-angled



Scalene

- An **isosceles triangle** will have two angles the same size.
- In an **equilateral triangle**, all angles will be 60° .
- A **right-angled triangle** will have one angle that is 90° , which means the other two angles will have a total of 90° .
- A **scalene triangle** will have all angles of a different size.

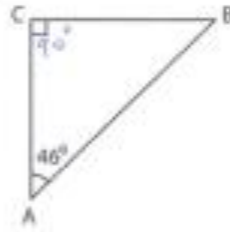
Exercise (4): Work out the missing angles.

1)



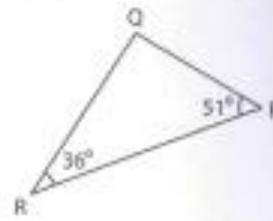
$m\angle U = 20^\circ$

2)



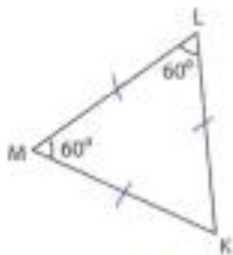
$m\angle B = 44^\circ$

3)



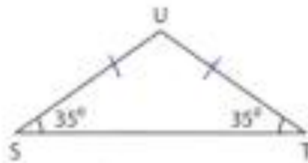
$m\angle Q = 93^\circ$

4)



$m\angle K = 60^\circ$

5)



$m\angle U = 110^\circ$

6)



$m\angle C = 50^\circ$

Angles in Quadrilaterals.

Remember that the angles in quadrilaterals add up to 360°

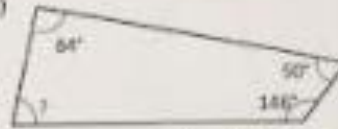
Exercise (5): Work out the missing angles (the first one has been done for you)

1)



$$75 + 90 + 90 = 255$$
$$360 - 255 = 105$$

2)



$$84^\circ + 50^\circ + 146^\circ = 280^\circ$$
$$360^\circ - 280^\circ = 80^\circ$$

3)



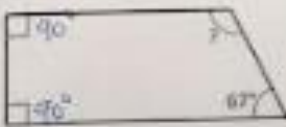
$$187^\circ$$

4)



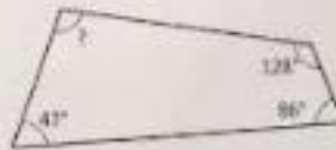
$$146^\circ$$

5)



$$113^\circ$$

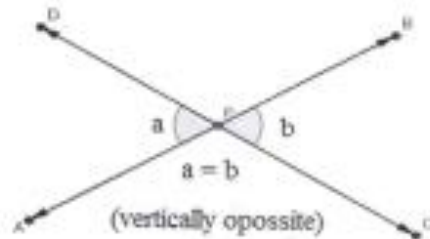
6)



$$99^\circ$$

Vertically opposite angles.

Vertically opposite angles are the angles formed **opposite** each other when two lines intersect. Vertically opposite angles **are always equal.**



Exercise (6): Work out the missing angles (the first one has been done for you)

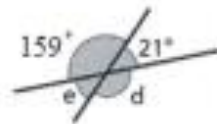
1)



$b = 132$ (vertically opposite)

$c = 48$

2)



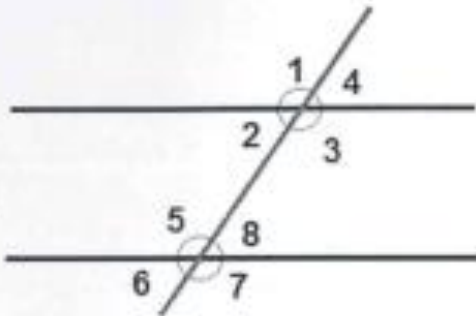
$e = 21$

$d = 159$

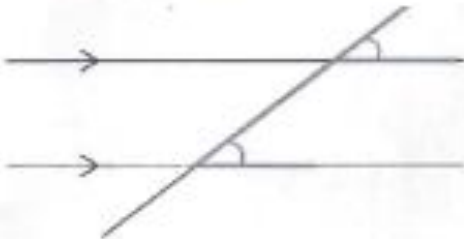
Corresponding and alternate angles

If we have **two parallel lines** and have a third line that crosses them as in the picture below - the crossing line is called a **transversal**

When a transversal intersects with two parallel lines eight angles are produced.

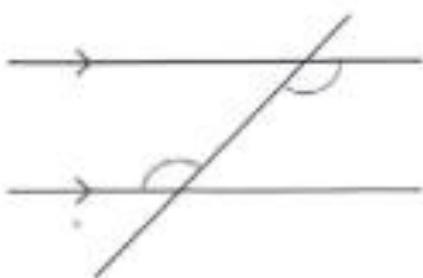


Corresponding angles.



When the angles are one **interior** and one **exterior** \Rightarrow the **same side**, then they are **equal** (corresponding)

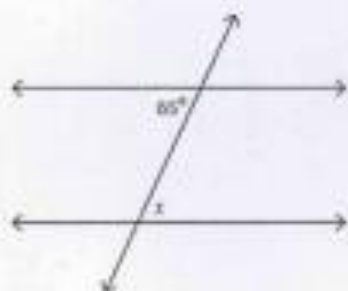
Alternate angles



When the angles are **both interior** and **opposite** to each other \Rightarrow they are **equal** (alternate)

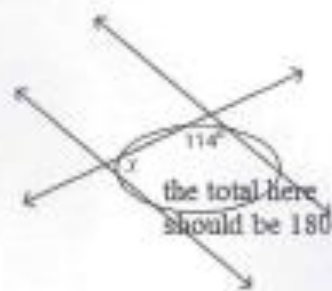
Exercise (7): Work out the missing angles (the first two have been done for you)

1)



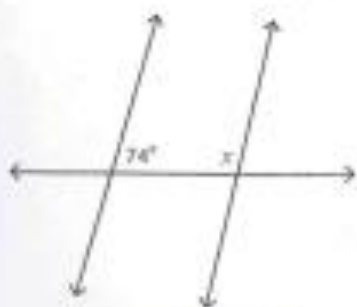
$$x = 65 \text{ (alternate)}$$

2)



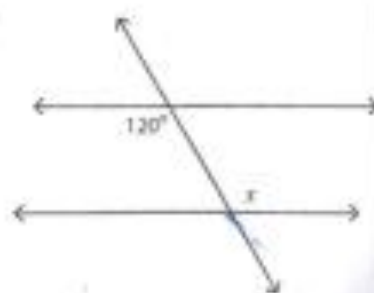
$$x = 180 - 114 = 66$$

3)



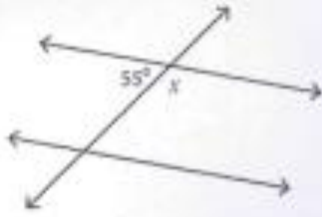
$$\begin{aligned} x &= 180 - 74 \\ &= 106 \text{ (allied)} \end{aligned}$$

4)



$$x = 120 \text{ (alternate)}$$

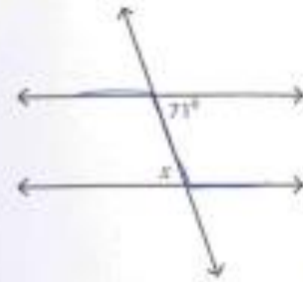
5)



$$x = 180^\circ - 55^\circ$$

$$= 125^\circ \text{ (supplementary)}$$

6)



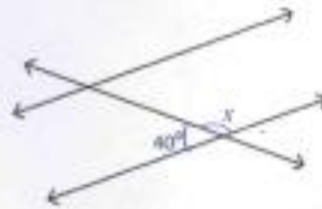
$$x = 71^\circ \text{ (alternate)}$$

7)



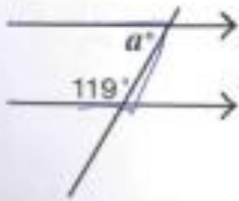
$$x = 149^\circ \text{ (alternate)}$$

8)



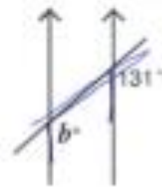
$$x = 180^\circ - 40^\circ$$

$$= 140^\circ \text{ (supplementary)}$$



$$a = 180^\circ - 119^\circ = 61^\circ$$

$$\text{(allied)}$$



$$b = 131^\circ \text{ (corresponding)}$$

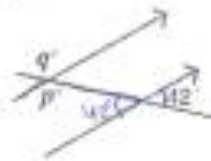
11)



$m = 77^\circ$ (alternate with $\angle n$)

$n = 180^\circ - 77^\circ = 103^\circ$ (supplementary)

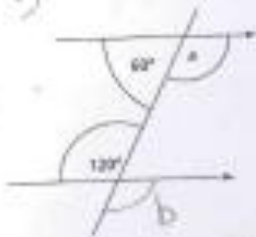
12)



$p = 180^\circ - 42^\circ = 138^\circ$ (C-shape)

$q = 138^\circ$ (vertically opposite with $\angle p$)

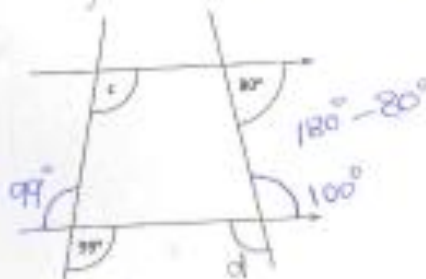
13)



$a = 180^\circ - 60^\circ = 120^\circ$ (straight line)

$b = 120^\circ$ (vertically opposite with $\angle a$)

14)



$c = 99^\circ$

$d = 100^\circ$

15)



$a = 180^\circ - 118^\circ = 62^\circ$

16)



$a = 65^\circ$ (alternate)

17)



$\angle b = 180^\circ - 75^\circ$ (allied)
 105°

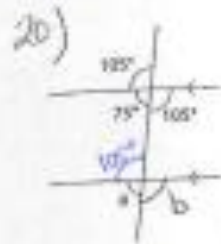
18)



$\angle d = 180^\circ - 110^\circ$ (allied)
 70°



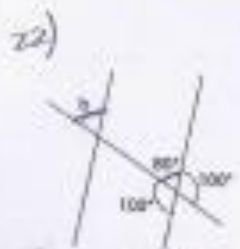
$\angle c = 180^\circ - 60^\circ = 120^\circ$
 $\angle b = 60^\circ$ (alternate with $\angle 60^\circ$)



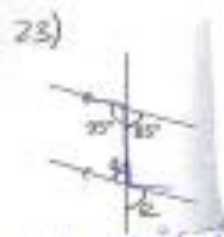
$\angle a = 180^\circ - 105^\circ = 75^\circ$
 $\angle b = 105^\circ$



$\angle d = 100^\circ$ (Corresponding with $\angle 100^\circ$)
 $\angle c = 100^\circ$ (Vertically opposite with $\angle 100^\circ$)



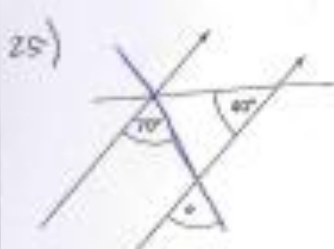
$\angle b = 80^\circ$ (Corresponding with $\angle 80^\circ$)



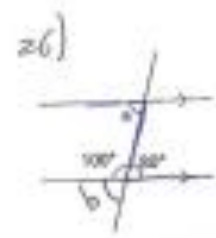
$\angle d = 65^\circ$ (alternate)
 $\angle c = 85^\circ$



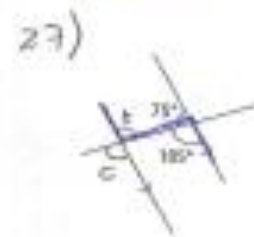
$r = 40^\circ$ (Corresponding with $\angle 40^\circ$)
 $\angle g = 35^\circ + 40^\circ = 75^\circ$
 $180^\circ - 75^\circ = 105^\circ$



$\angle a = 70^\circ$ (Corresponding with $\angle 70^\circ$)



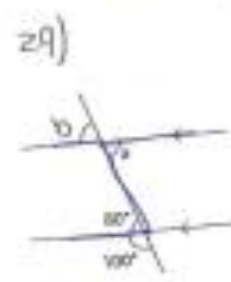
$\angle a = 80^\circ$ (alternate)
 $\angle b = 80^\circ$ (Vertically opposite)



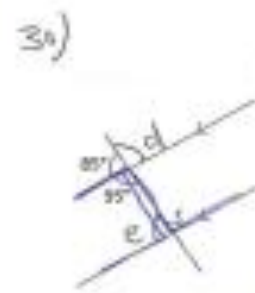
$\angle b = 105^\circ$ (alternate)
 $\angle c = 105^\circ$ (Vertically opposite)



$\angle c = 70^\circ$ (alternate)
 $\angle d = 180^\circ - 70^\circ = 110^\circ$



$\angle a = 80^\circ$ (alternate)
 $\angle b = 80^\circ$ (Vertically opposite)



$\angle c = 85^\circ$ (alternate)
 $\angle d = 95^\circ$ (Vertically opposite)
 $\angle c = 180^\circ - 95^\circ = 85^\circ$ (adjacent)

More examples about angles:

Answer the following question.

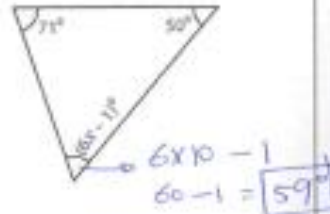
1) Find the value of x .

1)



$$\begin{aligned}x &\Rightarrow \text{sum} = 180^\circ \\100^\circ + 40^\circ + 2x &= 180^\circ \\140^\circ + 2x &= 180^\circ \\-140^\circ & \quad -140^\circ \\ \hline 2x &= 40^\circ \\ \Rightarrow x &= 20^\circ\end{aligned}$$

2)



$$\begin{aligned}x &\Rightarrow \text{sum} = 180^\circ \\71^\circ + 50^\circ + 6x - 1 &= 180^\circ \\6x + 120^\circ &= 180^\circ \\-120^\circ & \quad -120^\circ \\ \hline 6x &= 60^\circ \\ \Rightarrow x &= 10^\circ\end{aligned}$$

2)

State whether the given pairs are supplementary or not.

1) $24^\circ, 156^\circ$

$$24^\circ + 156^\circ = 180^\circ \quad \checkmark$$

2) $135^\circ, 102^\circ$

$$135^\circ + 102^\circ = 237^\circ \quad \times$$

3)

1) If $\angle 1$ and $\angle 2$ are complementary angles, and $m\angle 1 = 74^\circ$; find $m\angle 2$.

$$90^\circ - 74^\circ = 16^\circ$$

2) If $\angle 5$ and $\angle 6$ are complementary angles, and $m\angle 6 = 6^\circ$; find $m\angle 5$.

$$90^\circ - 6^\circ = 84^\circ$$

4) Calculate the value of x .

1)



$x = \underline{57^\circ}$

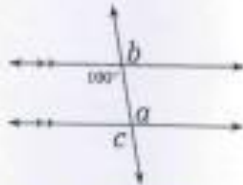
2)



$x = \underline{102^\circ}$

5) Find the missing angles and give the reason.

1)



a 100° (alternate with $\angle 100^\circ$)

b 100° (vertically opp.)

c 100° (Corresponding with $\angle 100^\circ$)

2)



x 111° (Corresponding with $\angle 111^\circ$)

y 111° (alternate with $\angle 111^\circ$)

z 111° (Vertically opposite with $\angle 111^\circ$)

3)

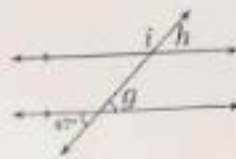


$$d = 180^\circ - 125^\circ = 55^\circ \text{ (supplementary)}$$

$$e = 125^\circ \text{ (alternate with } \angle 125^\circ)$$

$$f = 180^\circ - 125^\circ = 55^\circ$$

4)



$$g = 47^\circ \text{ (vertically opposite with } \angle 47^\circ)$$

$$h = 47^\circ \text{ (corresponding with } \angle g)$$

$$i = 180^\circ - 47^\circ = 133^\circ$$



Galaxy Z Flip4