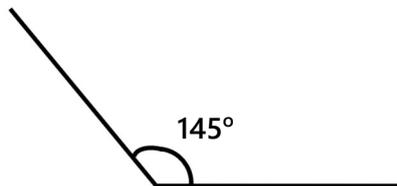# ANGLE FACTS

Task 1 – State whether each angle is acute, right, obtuse, straight, or reflex.

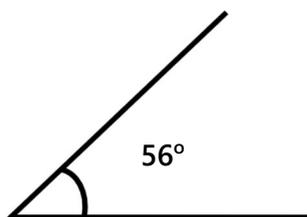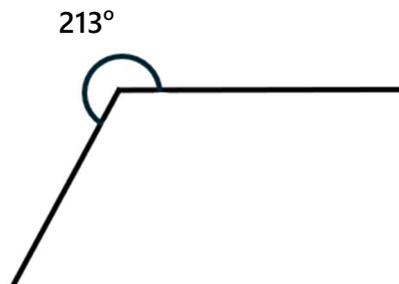1)

Right angle

2)

145°

Obtuse angle

3)

56°

Acute angle

4)

213°

Reflex angle

Task 2 – Complete the following sentences.

5) A right angle is 90°.
6) Angles on a straight-line sum to 180°.
7) Angles around a point sum to 360°.
8) Angles in a triangle sum to 180°.
9) Angles in a quadrilateral sum to 360°.
10) An equilateral triangle has three **equal** sides and three **equal** angles.
11) An isosceles triangle has two **equal** sides and two **equal** angles.

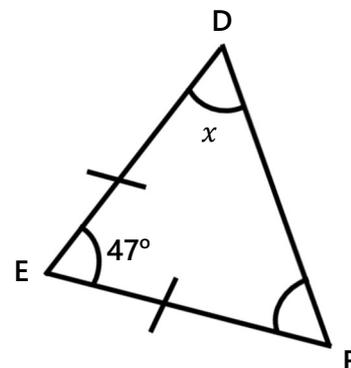**Task 3 – The diagrams in the following questions are not drawn accurately.**

12) ABC is a triangle. Work out the size of the missing angle marked x. Give a reason for your answer.

A   48° x B
67°
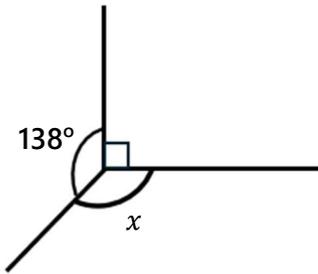C
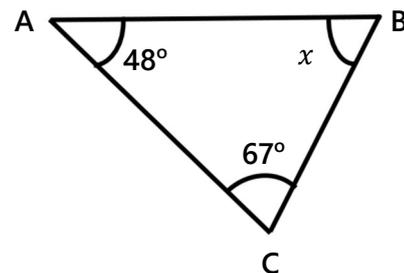
$x = 180 - 48 - 67 = \mathbf{65°}$
Angles in a triangle add to 180°

13) DEF is an isosceles triangle. Work out the size of the missing angle x.

D
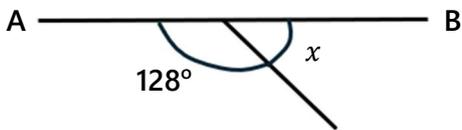x
E   47°
F

$x = \dfrac{180 - 47}{2} = \mathbf{66.5°}$

14) Work out the size of the missing angle x. Then, state the type of angle.

$x = 360 - 138 - 90 = \textbf{132°}$
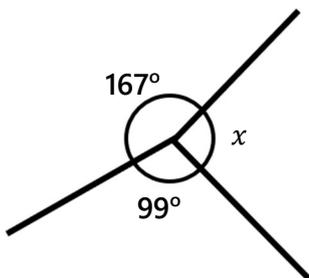x is an obtuse angle

15) AB is a straight line. Work out the missing angle x. Give a reason for your answer.

$x = 180 - 128 = \textbf{52°}$
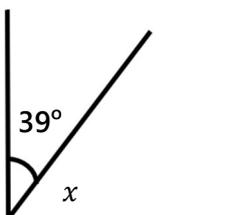**Angles on a straight line add to 180°**

16) Work out the size of the missing angle x. Give a reason for your answer.

$x = 360 - 167 - 99 = \textbf{94°}$
Angles around a point add to 360°

17) A right angle is pictured below. Work out the size of the missing angle.

$x = 90 - 39 = \textbf{51°}$

18) ABCD is a square. Work out the size of the missing angle x.
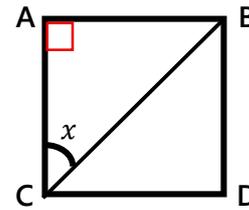
ABC is an isosceles triangle because AB = AC
$180 - 90 = 90°$
$x = \dfrac{90}{2} = \textbf{45°}$

19) A straight line is shown below. Work out the size of the angle x.

$180 - 62 = 118°$
$x = 118 \div 2 = \textbf{59°}$

20) A parallelogram is pictured below. Work out the size of the missing angle x. Give two reasons for your answer.

$x = 180 - 34 - 88 = \textbf{58°}$

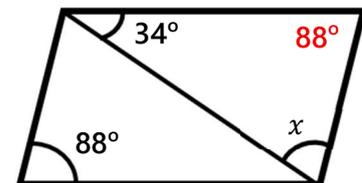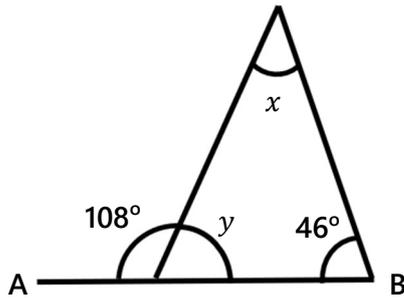**Opposite angles in a parallelogram are equal.**

Angles in a triangle add to 180°.

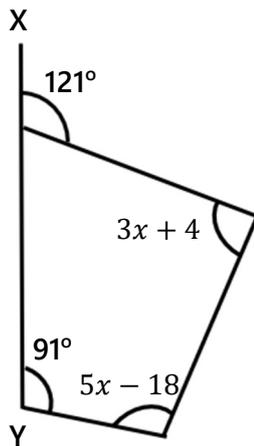**21)** AB is a straight line. Work out the missing angles x and y. Give a reason for each stage in your working.

$y = 180 - 108 = \mathbf{72°}$
Angles on a straight line add to 180°

$x = 180 - 72 - 46 = \mathbf{62°}$
Angles in a triangle add to 180°

22) XY is a straight line. Work out the size of x. Give a reason for each stage in your working.

$180 - 121 = 59°$
Angles on a straight line add to 180°

$3x + 4 + 5x - 18 + 91 + 59 = 360$
$8x + 136 = 360$
$8x = 224$
$x = \mathbf{28°}$
Angles in a quadrilateral add to 360°

23) Triangle ABC is shown below. Work out the size of the missing angles x, y and z. Give a reason for each stage in your working.
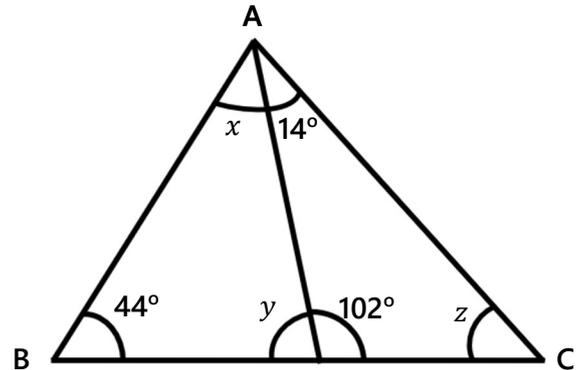
$y = 180 - 102 = \mathbf{78°}$
Angles on a straight line add to 180°

$x = 180 - 44 - 78 = \mathbf{58°}$
Angles in a triangle add to 180°

$z = 180 - 102 - 14 = \mathbf{64°}$
Angles in a triangle add to 180°

Task 4

24) Around a point, there are 5 equal angles. Work out the size of each angle.
$360 \div 5 = \mathbf{72°}$

25) A straight line is split into two angles. One angle is 5 times the size of the other. Work out the size of both angles.
$5x + x = 180$
$6x = 180$
$x = 30°$

Missing angles:
$\mathbf{30°}, \qquad \mathbf{150°}$

26) Four angles around a point are 72°, 108°, 95°, and $x°$. Work out the size of the angle x.
$72 + 108 + 95 = 275°$
$360 - 275 = \mathbf{85°}$

27) The angles in a triangle are in the ratio $1 : 4 : 5$. Work out the size of the largest angle and state the type of angle.

$1 + 4 + 5 = 10$

$180 \div 10 = 18$

$5 \times 18 = \mathbf{90°}$

Right angle

28) A straight line is split into three angles. Two are equal, and the third is 60° larger than each of the equal angles. Work out the size of all three angles.

Angle 1: x

Angle 2: x

Angle 3: $x + 60$

$x + x + x + 60 = 180$

$3x + 60 = 180$

$3x = 120$

$x = 40°$

$\mathbf{40°, 40°, 100°}$

29) Three angles on a straight line are as follows:

$(2x + 10)°$ $(3x - 20)°$ $(x + 40)°$

Work out the value of x.

$2x + 10 + 3x - 20 + x + 40 = 180$

$6x + 30 = 180$

$6x = 150$

$x = \mathbf{25°}$

30) In an isosceles triangle, the two equal angles are each $(x + 20)°$ and the third angle is $(2x - 10)°$. Work out the value of x.

$x + 20 + x + 20 + 2x - 10 = 180$

$4x + 30 = 180$

$4x = 150$

$x = \mathbf{37.5°}$

31) Angles around a point are as follows:

$(3x + 15)°$

$(2x + 10)°$

$(x + 25)°$

$(4x - 10)°$

Work out the value of x.

$3x + 15 + 2x + 10 + x + 25 + 4x - 10 = 360$

$10x + 40 = 360$

$10x = 320$

$x = \mathbf{32°}$

32) A quadrilateral has angles in the ratio:

$2 : 3 : 4 : 6$

Work out the size of all four angles.

$2 + 3 + 4 + 6 = 15$

$360 \div 15 = 24$

$2 : 3 : 4 : 6$

$\times 24 \qquad \times 24$

$48 : 72 : 96 : 144$

$\mathbf{48°, 72°, 96°, 144°}$

Challenge

33) A square and three triangles are pictured in the diagram below.

Work out the size of the missing angles. Give a reason for each stage in your working.

Angles at the base of an isosceles triangle are equal

$$t = \frac{180 - 22}{2} = \mathbf{79°}$$

$$u = \mathbf{79°}$$

Angles around a point add to 360
$$v = 360 - 79 - 126 - 90 = \mathbf{65°}$$

Angles on a straight line add to 180
$$y = 180 - 91 - 22 = \mathbf{67°}$$

Angles in a triangle add to 180
$$x = 180 - 65 - 67 = \mathbf{48°}$$

Angles at the base of an isosceles triangle are equal
$$z = \frac{180 - 126}{2} = \mathbf{27°}$$