Year 6 Maths Home Learning | Summer Term

W.C. 6th July

Maths Answers

Monday

Fluent in 5

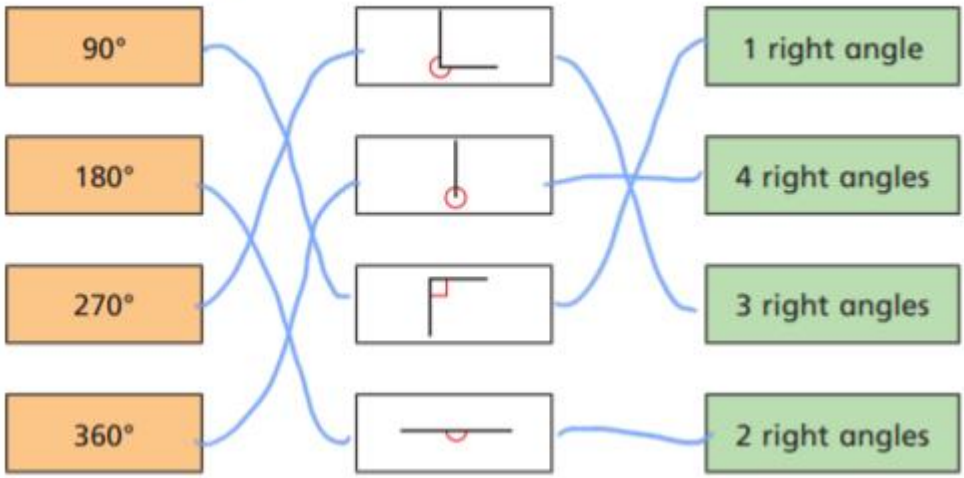
Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1. 854.34 + **69.44** = 923.78 (W)
2. 45 x 32 = **1,440** (W)
3. 15% of 80 = **12** (M)
4. **5.2** ÷ 1.3 = 4 (M)
5. $\frac{1}{5} + \frac{3}{10} = \frac{\mathbf{5}}{\mathbf{10}}$ *or* $\frac{\mathbf{1}}{\mathbf{2}}$ (M)
6. 800 + 679 = **1,479** (M)

Mild

Calculate angles, including vertically opposite angles

1 Match each angle to its picture and number of right angles.



2 Complete the sentences.

There is [1] right angle in a quarter turn.

A quarter turn is [90] degrees.

There are [2] right angles in a half turn.

A half turn is [180] degrees.

There are [3] right angles in a three-quarter turn.

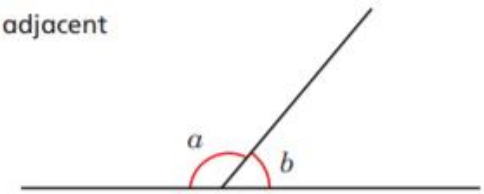
A three-quarter turn is [270] degrees.

There are [4] right angles in a full turn.

A full turn is [360] degrees.

Calculate angles

1 Two angles, a and b, are adjacent on a straight line.



a) Measure angles a and b.

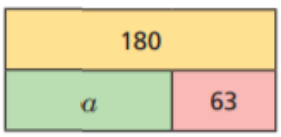
$a =$ [130°] $b =$ [50°]

b) What is the total of the two angles? [180°]

c) Complete the sentence.

Adjacent angles on a straight line [sum to 180°]

2 **a)** Complete the fact family for the bar model.



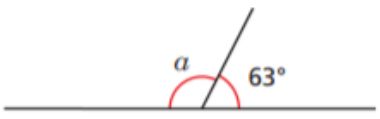
$a + 63 =$ [180] $180 -$ [63] $= a$

$63 +$ [a] $=$ [180] $180 - a =$ [63]

b) Tick the calculation in part a) that helps you work out the value of a.

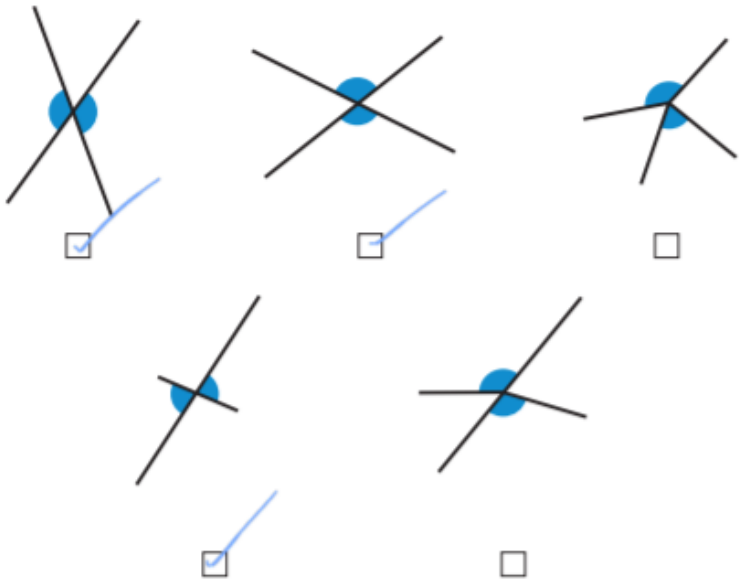
c) Work out the value of a. $a =$ [117]

d) How does the bar model help you to calculate angle a?



Vertically opposite angles

Tick the pairs of angles that are vertically opposite.



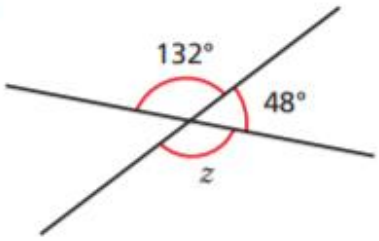
Work out the sizes of the unknown angles.

Give reasons for your answers.

a)

$y =$ 29° because vertically opposite angles are equal.

b)



$z =$ 132° because vertically opposite angles are equal.

a = 60° b = 120°

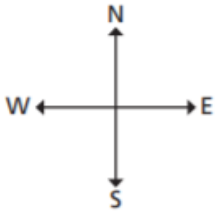
a = 30° b = 150°

Angle b = 130°

Angle c = 110°

Medium

Here is a compass.



a) Huan is facing north.

He turns half a turn.

What direction is he facing now? south

b) Whitney is facing east.

She turns 180°.

What direction is she facing now? west

c) Alex is facing west.

She turns a quarter turn clockwise.

What direction is she facing now? north

d) Amir is facing west.

He turns 90° anticlockwise.

What direction is he facing now? south

e) Kim is facing south.

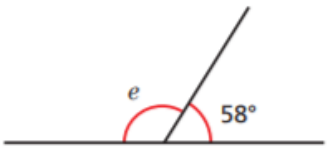
What angle does she need to turn through to face east?

90° anti-clockwise or 270° clockwise

Calculate angles

Work out the unknown angles.

a)

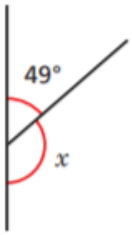


$e =$ 122°

b)

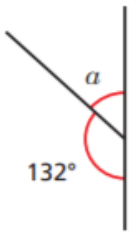
$g =$ 39°

c)



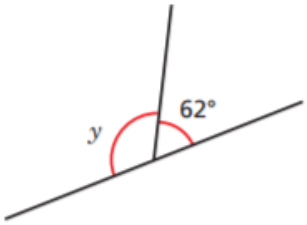
$x =$ 131°

d)



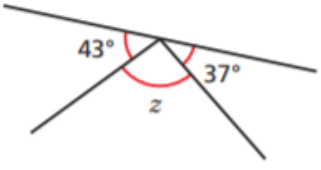
$a =$ 48°

e)



$y =$ 118°

f)

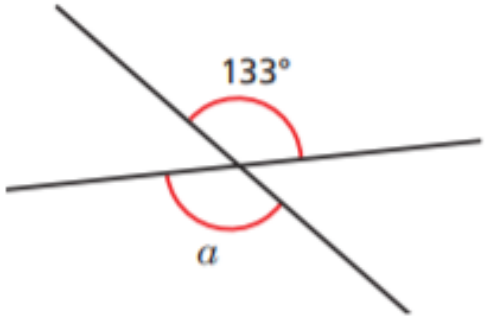


$z =$ 100°

Vertically opposite angles

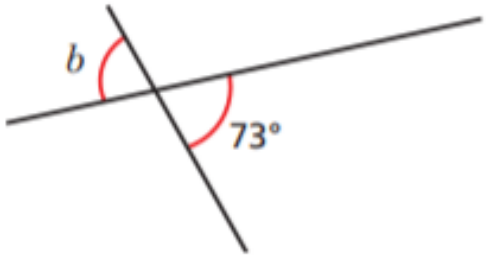
Work out the unknown angles.

a)



$a =$ 133°

b)



$b =$ 73°

a = 56° b = 124°

a = 94° b = 86°

180°

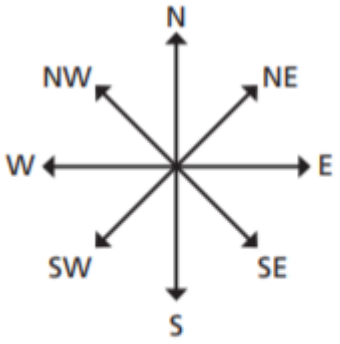
360°

Spicy

a) Dexter is facing north-east.

He turns half a turn.

What direction is he facing now?



south - west

b) Esther is facing south-west.

She turns 270° anticlockwise.

What direction is she facing now? north-west

c) Mo is facing south-west.

He turns, and he is still facing south-west.

How many degrees did he turn through? 360°

Complete the statements.

a) $\frac{1}{2}$ of a full turn = 180°

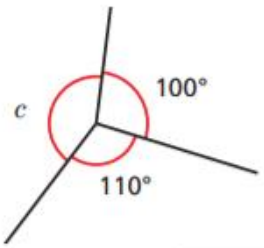
b) $\frac{1}{4}$ of a full turn = 90°

c) $\frac{3}{4}$ of a full turn = 270°

Calculate angles

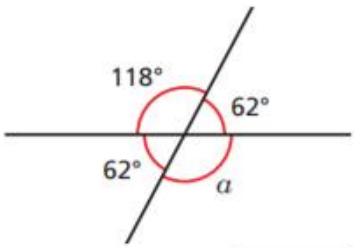
Work out the unknown angles.

a)



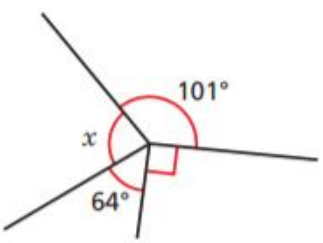
c = 150°

c)



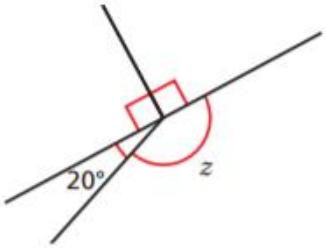
a = 118°

b)

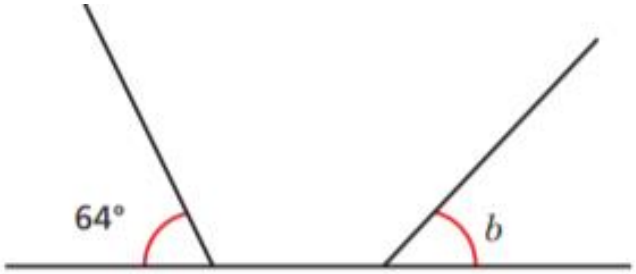


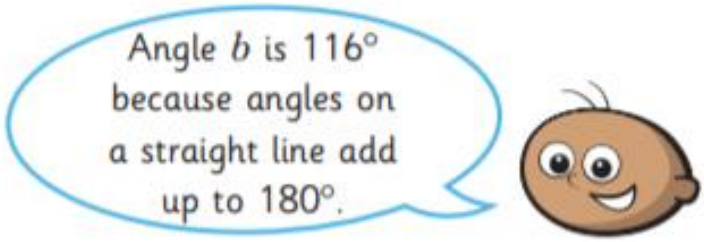
x = 105°

d)



z = 160°





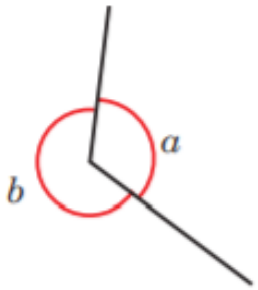
Do you agree with Tommy? No

Explain your answer.

The angles are not adjacent. There is not enough information to work out the size of angle b.

Use the information to work out the unknown angles.

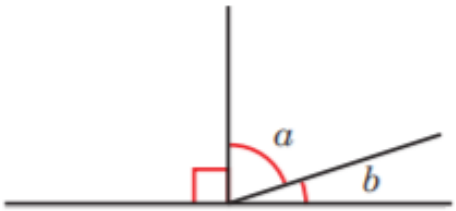
a) Angle a is half the size of angle b.



$a =$ 120°

$b =$ 240°

b) Angle a is four times the size of angle b.



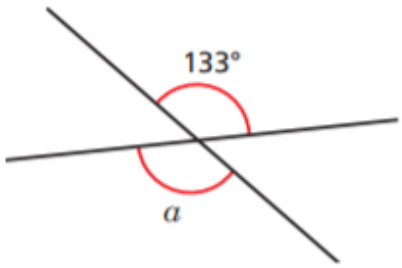
$a =$ 72°

$b =$ 18°

Vertically opposite angles

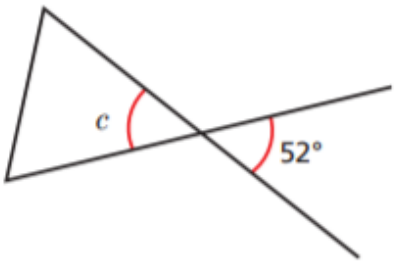
Work out the unknown angles.

a)



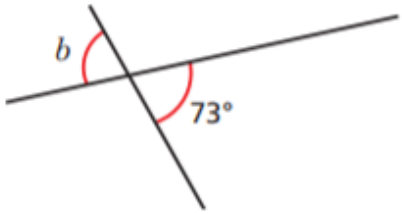
$a =$ 133°

c)



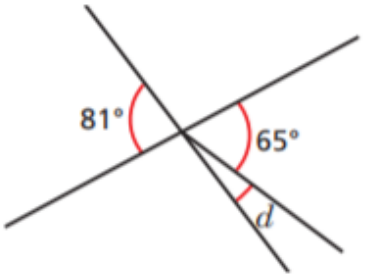
$c =$ 52°

b)



$b =$ 73°

d)



$d =$ 16°

a = 54°b = 74°c = 52°

a = 89°b = 68°c = 23°

180°

360°

a = true, b = false, c = true and d = false.

Angle d = 53°

Barney is not correct because 87°and 74°total 161°. This means that angle c must measure 19°.

Shona is not correct because angle d must be 52°using knowledge of angles on a straight line. So angle a must be 52°. 52°+ 90°= 142°. 180°– 142°= 38°. Angle c is 38°.

Tuesday

Fluent in 5

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1. **0.1338** x 100 = 13.38 (M)
2. 653 ÷ 8 = **81** $\frac{5}{8}$ (W)
3. $\frac{5}{12} + \frac{1}{3} = \frac{9}{12}$ *or* $\frac{3}{4}$ (M)
4. 25% of 140 = **35** (M)
5. 784 – 220 = **564** (M)
6. 3,832 x 18 = **68,976** (W)

Angles in triangles

Mild

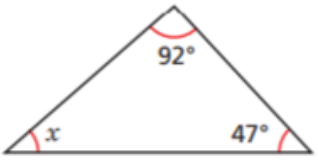
Angle a = 90°

Angle y = 60°

Work out the sizes of the unknown angles.

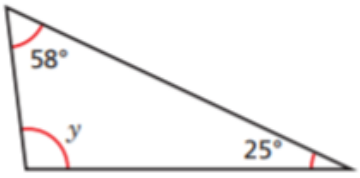
Give reasons for your answers.

a)



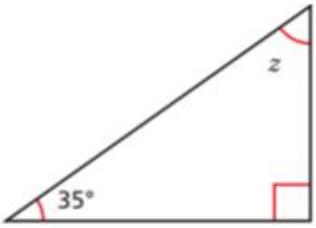
$x =$ 41° because angles in a triangle sum to 180°

b)



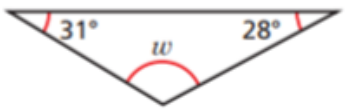
$y =$ 97° because angles in a triangle sum to 180°

c)



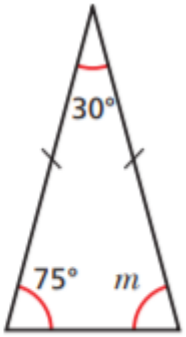
$z =$ 45° because angles in a triangle sum to 180°

d)



$w =$ 121° because angles in a triangle sum to 180°

Here is a triangle.



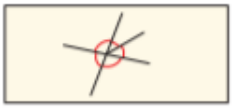
a) What type of triangle is it?

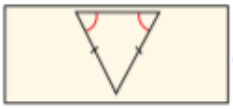
Isosceles

How do you know?

There are two sides of equal length.

Match each diagram to the correct rule.





- Angles on a straight line sum to 180°
- Angles around a point sum to 360°
- Angles in a triangle sum to 180°
- In an isosceles triangle, two angles are equal
- Vertically opposite angles are equal

Angle a = 50°

Angle b = 55°

Angle c = 265°

Angle d = 310°

Kelly is wrong as a = 40° and b = 120°. Angle a is calculated by knowing that angles in a triangle total 180°. Angle b is calculated by knowing that angles on a straight line total 180° (180° – 40° = 120°).

Medium

Right-angled scalene

Isosceles

80°

90°

a) Two angles in a triangle are 42° and 57°.

What is the size of the third angle?

81°

b) Two of the angles in a triangle are 12°.

What is the size of the third angle?

156°

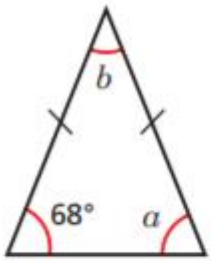
c) One of the angles in a triangle is 38°. Another angle is twice the size of the first angle.

What is the size of the third angle?

66°

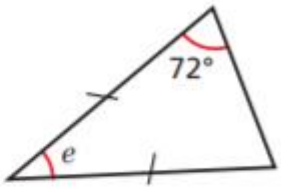
Work out the sizes of the unknown angles.

a)



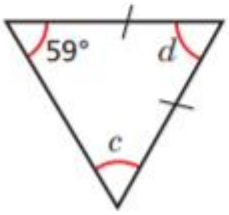
a = 68° b = 44°

c)



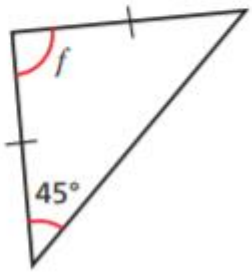
e = 36°

b)



c = 59° d = 62°

d)

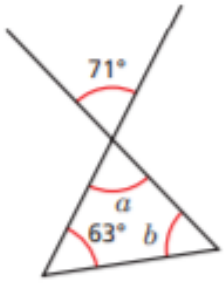


f = 90°

Work out the sizes of the unknown angles.

Give reasons for each stage of your working.

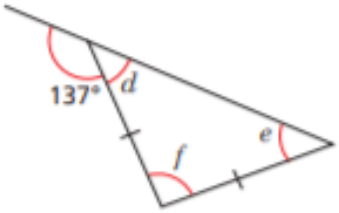
a)



$a =$ 71° because vertically opposite angles are equal

$b =$ 46° because angles in a triangle sum to 180°

b)

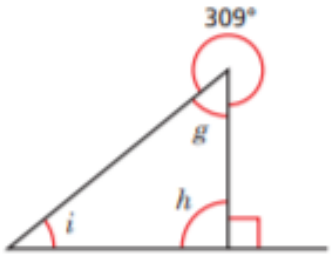


$d =$ 43° because angles on a straight line sum to 180°

$e =$ 43° because in an isosceles triangle two angles are equal.

$f =$ 94° because angles in a triangle sum to 180°

c)



$g =$ 51° because angles around a point sum to 360°

$h =$ 90° because angles on a straight line sum to 180°

$i =$ 39° because angles in a triangle sum to 180°

Angle a = 29°

Angle b = 37°

Angle c = 268°

Angle d = 335°

Rosie is wrong as a = 38°, b = 277°, c = 45° and d = 135°. Angles a and c can be calculated using knowledge that angles in a triangle total 180°. Angle b can be calculated once angle a is known and using knowledge that the angle of a complete circle is 360°. Angle d can be calculated using knowledge that the angle of a straight line is 180°.

Spicy

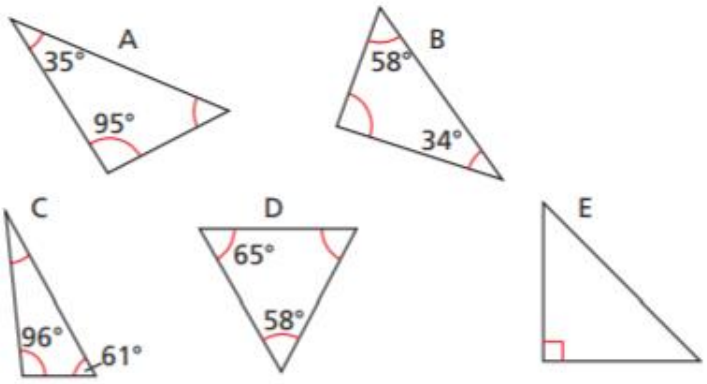
B

A

82°

93°

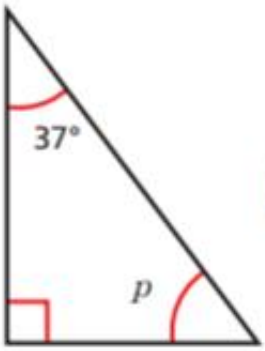
Sort the triangles into the table.

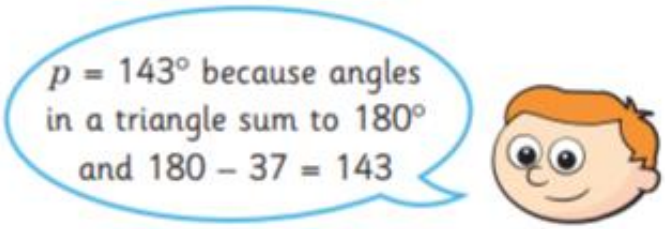


0 acute angles	1 acute angle	2 acute angles	3 acute angles
		A C E	B D

Are any of the columns empty? Why?

The sum of the angles in a triangle is 180° so there has to be at least 2 acute angles





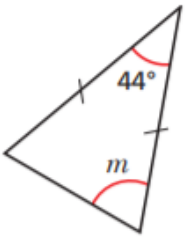
Do you agree with Ron? No

Explain your answer.

He hasn't included the right angle. p = 53°

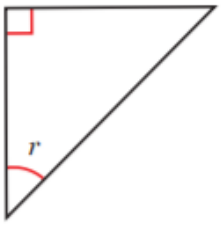
Work out the sizes of the unknown angles.

a)



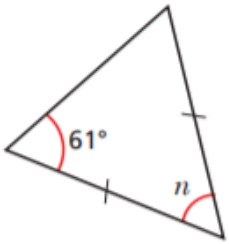
$m =$ 68°

c)



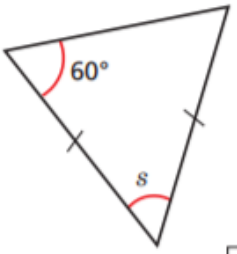
$r =$ 45°

b)



$n =$ 58°

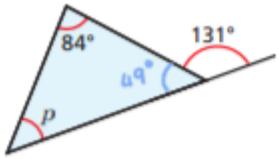
d)



$s =$ 60°

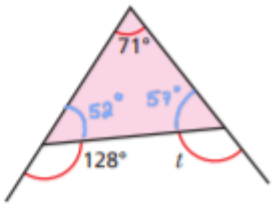
Work out the sizes of the angles marked with letters.

a)



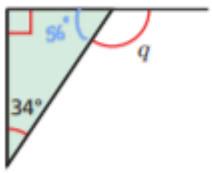
$p =$ 47°

e)



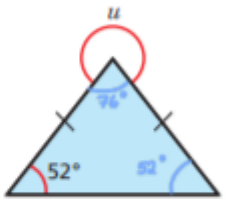
$t =$ 123°

b)



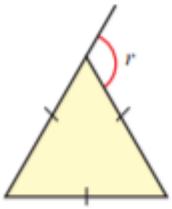
$q =$ 124°

f)



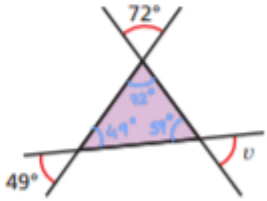
$u =$ 284°

c)



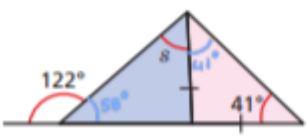
$r =$ 120°

g)



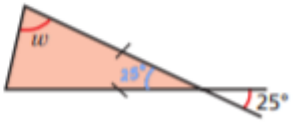
$v =$ 59°

d)



$s =$ 40°

h)



$w =$ 77.5°

Angle a = 98°, angle b = 46°

Angle c = 83°, angle d = 98°

Angle e = 276°

Angle f = 317°

Angle g = 315°

Angle h = 300°

Stan is correct as a = 74°, b = 31°, c = 68°, d = 68° and e = 112°.

Angles b and e can be calculated using knowledge that angles in a triangle total 180°.

Angles a, c and d can be calculated using knowledge that the angle of a straight line is 180°.

Wednesday

Fluent in 5

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

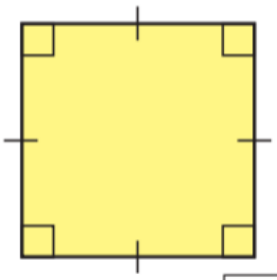
1. $8^2 = \mathbf{64}$ (M)
2. $874 \div 21 = \mathbf{41\ r\ 13}$ (W)
3. $8 + 3 \times 6 = \mathbf{24}$ (M)
4. 35% of 60 = **21** (M)
5. $\frac{1}{4} + \frac{1}{20} = \frac{\mathbf{6}}{\mathbf{20}}$ *or* $\frac{\mathbf{3}}{\mathbf{10}}$ (M)
6. 7,584 + 19,848 = **27,432** (W)

Angles in quadrilaterals

Mild

Work out the sum of the angles in each shape.

a)



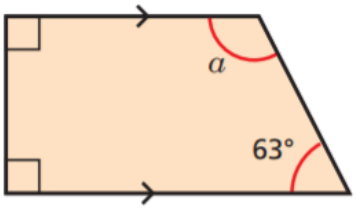
360°

b)

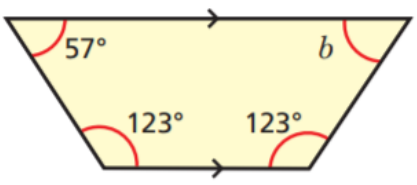
360°

Work out the size of the unknown angle in each trapezium.

a)



b)

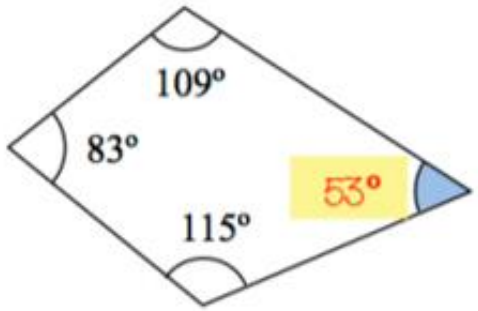


$a =$ 117°

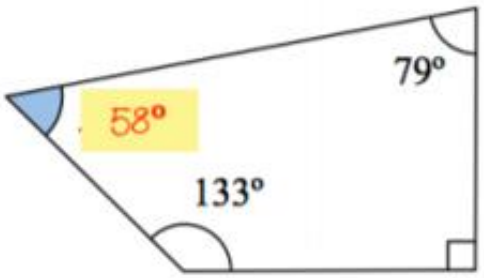
$b =$ 57°

Mollie is correct; all angles in a square are right angles.

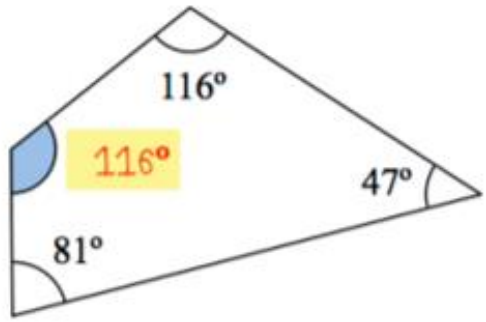
A1 Work out the value of x



A2 Work out the value of x



A3 Work out the value of x

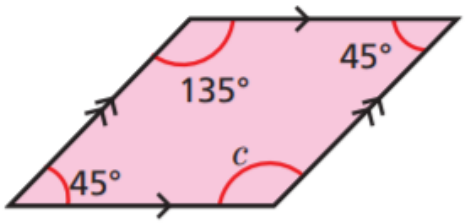


The right-angled triangle doesn't belong as it is not a quadrilateral; however, it can also be argued that the parallelogram does not belong as all the others have at least one right-angle!

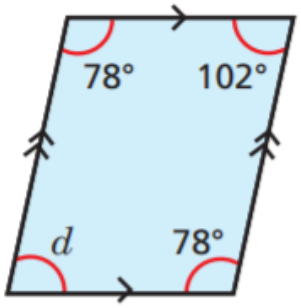
Medium

Work out the sizes of the unknown angles.

a)



b)



$c =$ 135°

$d =$ 102°

c) What do you notice about opposite angles in a parallelogram?

They are equal.

a) 57°
b) 57°
c) 123°
d) 153°
e) 103°
f) 37°

a) Adam says, "To be a quadrilateral, a polygon needs to have at least one right-angle."
False – most quadrilaterals do not have a right angle.

b) Sally says, “All quadrilaterals have at least one acute angle.”

False – for example, rectangles / squares have four right angles.

1) a) Rhombus: 120° - Can be found by understanding that opposite angles are equal.

b) Isosceles Trapezium: 65° - Can be found by understanding that the base angles are equal.

c) Square: 90° - Can be found by understanding that all angles in a square are right angles.

d) Kite: 110° and 50° - 110° can be found by understanding that diagonally opposite angles are equal in a kite. 50° can be found by: 360° - (90°+ 110°+110°).

2) a) 68°

b) Both missing angles are 138°

c) 106°

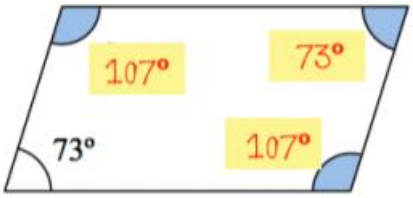
d) a) 101 °

b) 84 °

c) 63 °

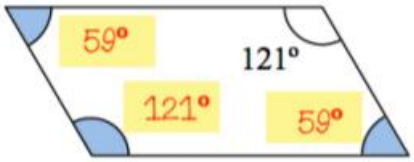
Spicy

B1 This is a parallelogram.



Work out the values of x, y and z

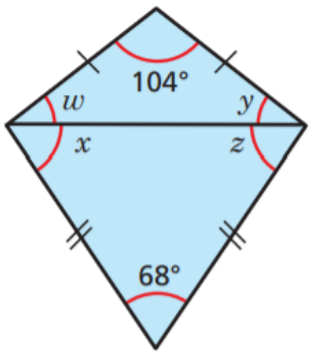
B2 This is a parallelogram.



Work out the values of x, y and z

Two isosceles triangles are joined to form a kite.

a) Work out the sizes of the unknown angles.



w = 38° y = 38° x = 56° z = 56°

b) Work out $w + x$.

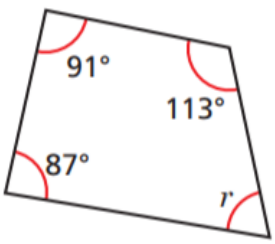
94°

c) Work out $y + z$.

94°

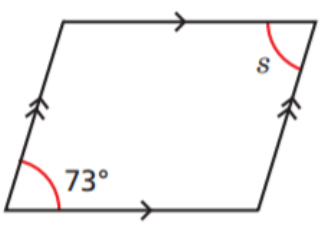
Work out the sizes of the unknown angles.

a)



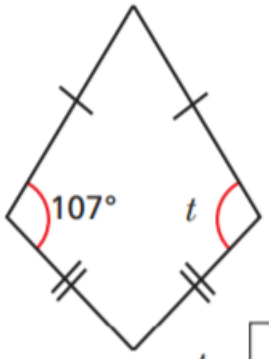
r = 69°

b)



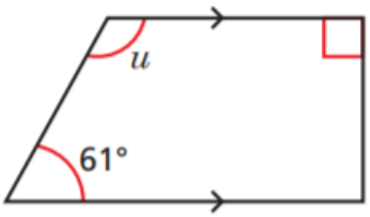
s = 73°

c)



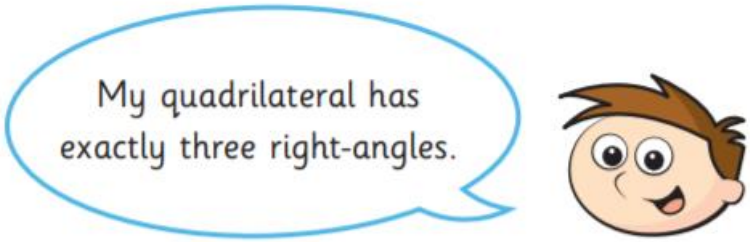
$t =$ 107°

d)



$u =$ 119°

Teddy is drawing a quadrilateral.



Is Teddy's quadrilateral possible? No

Explain your answer.

$90 \times 3 = 270$ $360 - 270 = 90$

If three angles were right angles the fourth would also have to be a right angle.

1) The first reason is that angles in a quadrilateral add to 360° and the angles in this kite add to 356°.
The second reason is that opposite angles in this kite shape are equal but Monika's angle measurements are not equal.

2) 147° and 112° are the missing angles.

3) a) Could not belong to the parallelogram as there is not two sets of equal angles.

b) Could belong to the parallelogram as the angles add to 360° and it has two sets of equal angles.

c) Could not belong to the parallelogram as the angles add to 358° not 360°.

Thursday

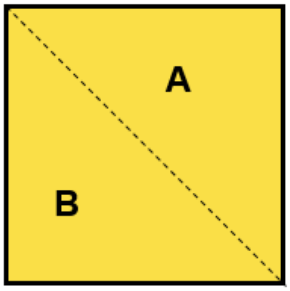
Fluent in 5

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1. 1.38 + 3.48 = **4.86** (M)
2. 98.384 + 12.843 = **111.227** (W)
3. 65% x 120 = **78** (M)
4. 64 x 4 = **256** (M)
5. 563 x 9 = **5,067** (W)
6. 100 x **5.784** = 578.4 (M)

Angles in polygons

Mild



a) What do the angles of triangle A add up to? **180°**

b) What do the angles of triangle B add up to? **180°**

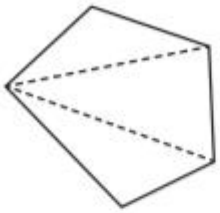
c) So what is the sum of interior angles in a quadrilateral?
360°

1 The sum of the interior angles of a triangle is 180°.

Split the polygons into triangles to work out the sum of their interior angles. Your lines should not overlap.

The first one has been done for you.

a)



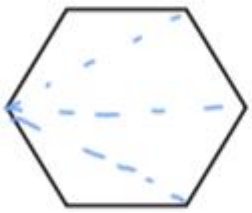
number of sides = 5

number of triangles = 3

3 × 180 = 540

The sum of the interior angles of a pentagon is 540°

b)



number of sides = 6

number of triangles = 4

4 × 180 = 720

The sum of the interior angles of a hexagon is 720°

c)

number of sides = 7

number of triangles = 5

5 × 180 = 900

The sum of the interior angles of a heptagon is 900°

180° - 108° = 72°

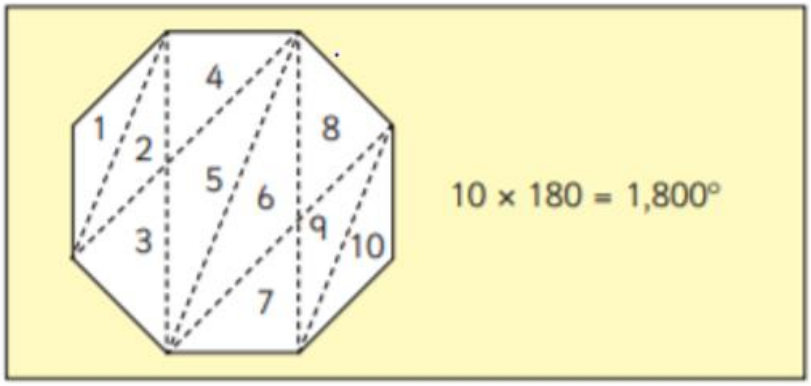
180° - 120° = 60°. x = 60°.

Medium

Shape	Number of sides	Number of triangles	180 x number of triangles	Sum of internal angles
Square	4	2	2 x 180°	360°
Pentagon	5	3	3 x 180°	540°
Hexagon	6	4	4 x 180°	720°
Heptagon	7	5	5 x 180°	900°
Octagon	8	6	6 x 180°	1080°

Dani is working out the sum of the interior angles of a polygon.

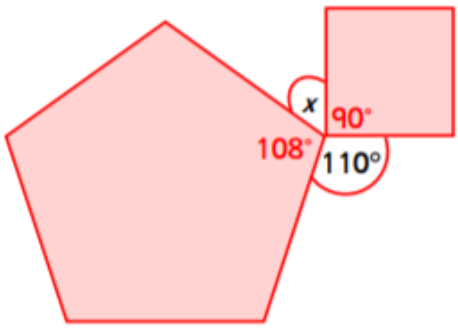
Here are her workings.



Do you agree with Dani?

Yes because the sum of the interior angles of a triangle is 180°. There are 10 triangles so 10 x 180° = 1800°

180° - 144° = 36°. x = 36°.



108° + 110° + 90° = 308°. 360° – 308° = 52°

$x = 52°$

Spicy

A heptagon has 5 triangles within it, so it has a total interior angle of 900° (180° x 5).

True or false?

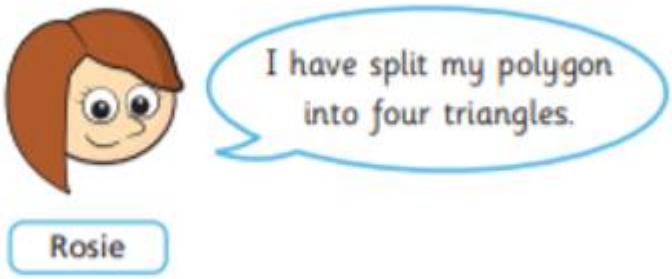
a) James says, "A hexagon has its name, because it can be split into six triangles as 'hex' means six."
False – 'hex' does mean six, but it has six sides (4 triangles).

b) Sally says, "The total interior angle of a pentagon is more than 540 degrees but less than 720 degrees."
False – the total interior angle of a pentagon = 540 degrees.

c) Ellie says, "A ten-sided shape - also called a decagon - can be split into eight triangles and has an angles sum of 1,440°."
True – a decagon does split into eight triangles.
180° x 8 = 1,440°

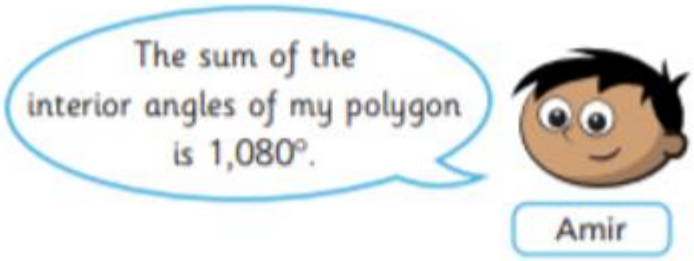
Rosie, Amir and Eva are drawing polygons.

a)



What polygon has Rosie drawn? hexagon

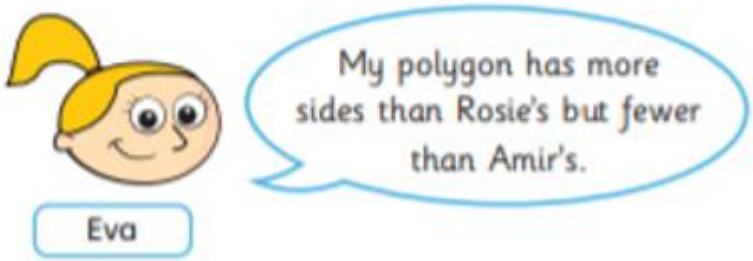
b)



What polygon has Amir drawn?

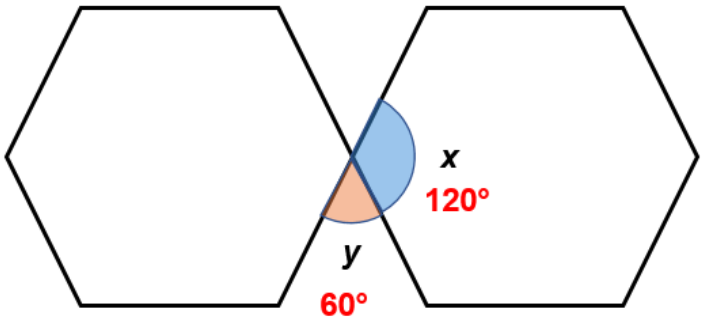
octagon

c)



What is the sum of the interior angles of Eva's polygon?

900°



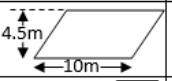
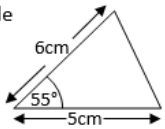
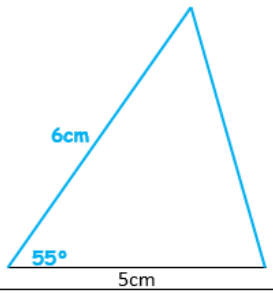
The interior angle of a hexagon is 120°. 180° – 120° = 60°. x = 60°.

Friday

Challenge of the Week

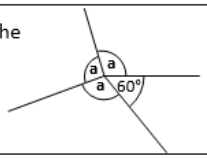
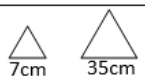
Key Skills

Mild

A: Place Value, Add, Subtract, Multiply and Divide		B: Fractions, Ratio, Proportion and Algebra		C: Measure and Geometry	
1. Write **nine million, seven thousand, three hundred and eight** in digits.	6:1 **9,007,308**	11. Which is the **largest** fraction? $\frac{2}{3}$. $\frac{5}{6}$ or $\frac{7}{12}$	6:7 $\frac{5}{6}$	21. How many **miles** are approximately equal to 4 **kilometres**?	6:18 **2.5**
2. What is the value of the **8** in this number? 1,384,721	6:1 **80,000**	12. $\frac{5}{6} + \frac{1}{9} =$	6:8 $\frac{17}{18}$	22. Give the length and width of **two** rectangles that have an area of $20m^2$.	6:20 **1x20, 2x10, 4x5**
3. Round 7.186 to 2 decimal places.	6:1 **7.19**	13. Simplify your answer. $\frac{2}{3} \times \frac{1}{2} =$	6:9 $\frac{1}{3}$	23. Find the **area** of this **parallelogram**. 	6:21 **$45m^2$**
4. What is the largest possible crowd? Attendance: 25,000 (to the nearest thousand)	6:2 **25,499**	14. 0.5738 x 1000	6:10 **573.8**	24. Calculate the **volume** of a cube with a 3cm side length. 	6:22 **$27cm^3$**
5. 1,482 x 15	6:3 **22,230**	15. 2.15 x 3	6:11 **6.45**	25. Draw this triangle **accurately** below: Use a ruler and a protractor.  	6:23 **Shape drawn with 55° (+/- 2°) angle and 6cm (+/- 2mm) side length**
6. 392 ÷ 14	6:3 **28**	16. Write this fraction as a **decimal** and a **percentage**. $\frac{1}{5}$	6:12 **0.2, 20%**		
7. Which is a **common multiple** of 4 and 6? 2 3 8 12 18	6:4 **12**	17. Find **35%** of 180.	6:13 **63**		
8. Which **factor** of 25 is also a **prime number**?	6:4 **5**	18. In a class of 25 pupils, $\frac{3}{5}$ are boys. How many girls are there?	6:14 **10**		
9. 68 – 24 ÷ 2	6:5 **56**	19. How much will a 5 minute call cost? Call charge: 30p + 7p per minute.	6:15 **65p**		
10. I have £10. I buy 2 coffees at £2.89 each. How much do I have left?	6:6 **£4.22**	20. What is the **10th term** of this sequence? 3, 7, 11, 15, 19, …	6:16 **39**		
Total (A)		Total (B)		Total (C)	
Test Total (A+B+C)		R (0-9)	Y (10-19)	G (20-25)	

Key Skills

Medium and Spicy

A: Place Value, Add, Subtract, Multiply and Divide		B: Fractions, Ratio, Proportion and Algebra		C: Measure and Problem Solving	
1. Write **one million, three hundred and eleven thousand, and six** in digits.	6:1 **1,311,006**	11. Which is the **largest** fraction? $\frac{2}{7}$. $\frac{3}{14}$ or $\frac{7}{28}$	6:7 $\frac{2}{7}$	21. Name the shape: "I have 4 sides equal in length but no right angles".	6:24 **Rhombus**
2. What is the value of the **7** in this number? 1,383,721	6:1 **700**	12. $\frac{3}{4} + \frac{2}{5}$ =	6:8 $\frac{23}{20}$ **or** $1\frac{3}{20}$	22. The **diameter** of a circle is 18cm. How long is the **radius**?	6:25 **9cm**
3. Round **8,523,912** to the nearest **hundred thousand**.	6:1 **8,500,000**	13. Simplify your answer. $\frac{2}{7} \times \frac{5}{6}$ =	6:9 $\frac{5}{21}$	23. Calculate the value of **a**. 	6:26 **100°**
4. To a number I add 7 then subtract 9 and get -3. What did I start with?	6:2 **-1**	14. 3.121 x 10	6:10 **31.21**		
5. 3,174 x 63	6:3 **199,962**	15. 5.24 x 4	6:11 **20.96**	24. Complete the line graph for drinks sold by a market stall:	6:29 **Line graph drawn**
6. Give your answer to the **nearest whole number**: 1,602 ÷ 13	6:3 **123**	16. Write this decimal as a **fraction** and a **percentage**. (0.25)	6:12 $\frac{1}{4}$ **,25%**		
7. Which is a **common multiple** of 16 and 24? 16 24 48 54 60	6:4 **48**	17. Find **30%** of 90.	6:13 **27**		
8. Circle **all** the **prime numbers**: (71) (73) 75 77	6:4 **71, 73**	18. What is the **scale factor**? 	6:14 **5**		
9. 48 ÷ 8 + 6 x 7	6:5 **48**	19. How long does a 5kg chicken take? To cook: 1 hour + 15mins per kg.	6:15 **2h 15m**		
10. How much cheaper is a meal? Burger £2.49 Fries £1.19 Meal £3.20	6:6 **48p**	20. What is the rule for this sequence? 5, 11, 17, 23, 29, ...	6:16 **Add 6**	25. Find the mean of these numbers: 10 7 4 12 9 18	6:30 **10**
Total (A)		Total (B)		Total (C)	
Test Total (A+B+C)		R (0-9)	Y (10-19)	G (20-25)	

Day	Fri	Sat	Sun
Drinks sold	52	60	36