Mathematics Department

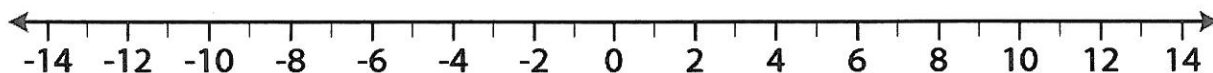Year 7 Home Learning Booklet

Stanground Academy

Contents: Comparing positive and negative numbers, BIDMAS, HCF and LCM, Prime numbers, approximation, area and perimeter, 3D shapes, angles, ratio

Student's name...

Teacher...

Comparing Positive and Negative Numbers

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←———————————————————————————————→
  -14  -12  -10  -8   -6   -4   -2   0    2    4    6    8    10   12   14
```

Q1   Write these lists of numbers in order of size, smallest first.

a)   8   -2   -6   0   -1   7

b)   -3   5   2   -1   1   0

c)   -12   8   10   -10   11   -8

Q2   Use the > or < symbols to complete these statements:

a) -4 ___ -5   b) 0 ___ -6

c) -12 ___ 15   d) -10 ___ 1

e) 1 ___ -5   f) 6 ___ -15

g) -15 ___ 4   h) 15 ___ -12

i) -6 ___ 14   j) -1 ___ 0

Q3   Which number is the larger number in each set?

a) -34 or 20   b) -40 or -60

c) 3 or -240   d) -135 or 120

e) 150, -150 or -160   f) -340, -1250 or 124

Q4   The table shows the temperatures in six cities one night.

City	Temp °C	City	Temp °C	City	Temp °C
London	9	Helsinki	-4	Berlin	6
Oslo	-6	New York	1	Moscow	-9

a)   How many degrees warmer than Oslo is New York?

b)   How many degrees warmer than Moscow is Berlin?

c)   How many degrees colder than London is Helsinki?

d)   How many degrees colder than Oslo is Moscow?

Calculating and BIDMAS
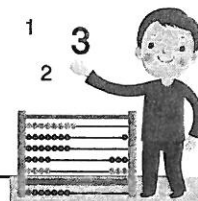
Starter questions

Complete the mnemonic for BIDMAS below:	Quick sums! How fast can you complete them?

Complete the mnemonic for BIDMAS below:

B rackets

I

D

M

A ddition

S

Quick sums! How fast can you complete them?

4 x 6 = ___	9 - 5 = ___	3 + 8 = ___
8 + 9 = ___	8 x 4 = ___	6 ÷ 3 = ___
10 ÷ 2 = ___	10 + 11 = ___	25 – 8 = ___
5 - 1 = ___	6 x 7 = ___	7 x 7 = ___
3 + 7 = ___	8 - 8 = ___	
11 x 12 = ___	21 ÷ 3 = ___	My time was:
2 - 3 = ___	144 ÷ 12 = ___	_____
6 ÷ 6 = ___	15 + 9 = ___	

Main questions

BIDMAS Wordsearch

Write the answers in words and then find them in the wordsearch on the next page.

1) 3 x 4 + 2 = _____ten_____

2) 9 – 2 x 4 = _____

3) 6 + 3^2 = _____

4) 9 – 6 ÷ 2 = _____

5) $\sqrt{25}$ = _____

6) (10 + 1) x 2 = _____

7) 3 x (9 + 3) = _____

8) 64 ÷ (18 - 2) = _____

9) 5 x 10 + 1 = _____

10) $6^2 + 3^2$ = _____

11) $(5 + 4)^2$ = _____

12) $20 - (4 - 2)^2$ = _____

13) $\sqrt{14 - 5 \times 2}$ = _____

14) $(5 - 3) \times (4^2 - 7)$ = _____

15) $\dfrac{6 + (5^2 - 13)}{4}$ = _____

16) (6 + 7) x 9 ÷ 3 = _____

17) $\sqrt{20 + 4^2} + 4 \times 6$ = _____

18) $(4^2 - 8)^2$ = _____

19) 100 – 2 x 6 = _____

20) $(3^2 + 3) \times 7$ = _____

f	u	a	c	a	y	i	h	n	e	r	e	n	e	t
o	s	n	w	f	t	r	e	v	u	n	i	b	n	h
u	n	t	g	u	r	e	i	o	o	e	g	i	a	r
r	r	w	d	s	t	f	f	y	r	d	h	c	n	u
p	r	m	g	h	y	y	t	r	i	h	t	f	n	o
o	t	o	g	t	t	h	l	s	r	e	y	l	k	f
i	d	i	r	e	g	f	i	t	t	v	f	y	i	y
n	e	o	n	i	e	x	i	h	y	i	o	a	s	t
t	f	i	e	t	w	o	i	f	d	f	u	l	o	x
f	n	f	o	u	r	r	n	r	t	y	r	s	m	i
i	t	h	i	r	t	y	n	i	n	e	a	t	t	s
v	o	w	t	y	t	n	e	w	t	o	e	a	e	r
e	n	s	s	f	i	f	t	y	o	n	e	n	o	a
t	s	i	x	t	e	e	n	o	t	n	h	t	a	h
h	x	a	y	r	h	t	r	m	o	o	n	e	e	v

HCF and LCM
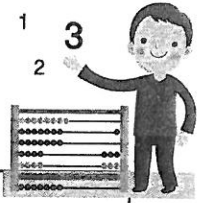
Write a definition for the words factor and multiple. Include examples in your definition.

Which is the odd number out of each list?

1. 16,32,40,52

2. 21,35, 62, 84

3. 24, 46, 84, 132

4. 18, 32, 48, 90

5. 16, 27, 54, 81

The bigger a number is the more factors it has. Is this statement true, sometimes true or false? Explain your answer with examples.

Main questions

HCF and LCM

Find the Highest Common Factor of these numbers:

1. 18 and 30
2. 15 and 20
3. 16 and 24
4. 12 and 36
5. 20 and 30
6. 28 and 70
7. 39 and 65
8. 38 and 57

Find the Lowest Common Multiple of these numbers

1. 6 and 7
2. 4 and 6
3. 5 and 8
4. 10 and 4
5. 16 and 5
6. 14 and 21
7. 2.2 and 5
8. 0.4 and 7

Approximation

Find approximate answers for:	
27×41	
$79 \div 38$	
18×4.1	
$179 \div 2.1$	
6.13×21	

Main task:

Estimate answers to the following. Write down the calculation you use.

Question	Approximate Answer
6 tickets costing £9.99 each	
11 books costing £3.99 each	
8 videos costing £4-85 each	
7 rolls of wallpaper costing £6.20 each	
4.2m of chain costing £2.99 per metre	
3m 15cm of material costing £4.99 per metre	
5.1 kg of beef costing £6.99 per kg	
4.85 kg of turkey costing £3.89 per kg	
If videos cost £7.99, how many can you buy for £41?	
If books cost £3.99, how many can you buy for £21?	

Area of Rectangles

Q1 Count the squares inside each rectangle to measure its area.

a)

b)

c)

d)

e)
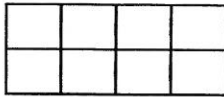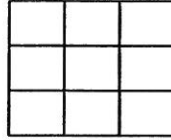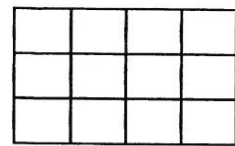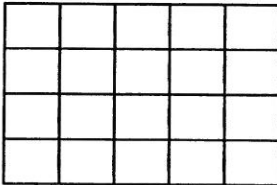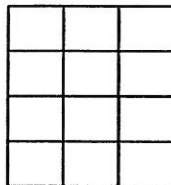
f)
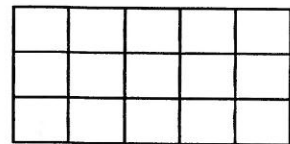
Q2. Calculate the area of each rectangle.

a) 5 cm, 2 cm

b) 3 m, 7 m

c) 4 cm, 1 cm

d) 6 m, 6 m
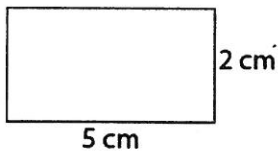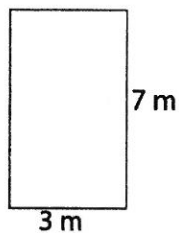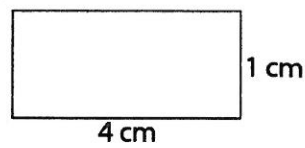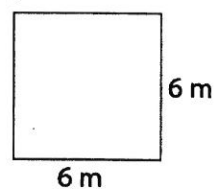
Q3 Find the missing dimensions for these rectangles.

Length	Width	Perimeter	Area
12 cm	8 cm		
9 mm	12 mm		
	6 in		30 in²
15 m		46 m	
		11 cm	7 cm²
		25 m	36 m²

Q4 Find the missing dimensions for these rectangles. All lengths are in cm.

Length	Width	Perimeter	Area
a	v		
$2x$	$5r$		
	5		$5c + 15$
$2c + y$		$10c + 2y$	
		$4f$	$f^2 - 1$
		18	$20 - 2c - 4c^2$

Perimeter of Complex Shapes

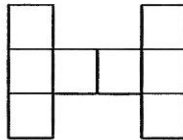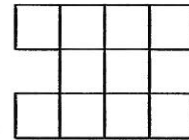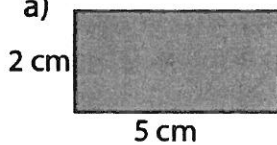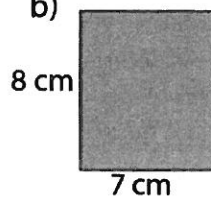**Q1** Count the edges of the squares around the edge of each shape to measure its perimeter.

a)

b)

c)

d)

e)
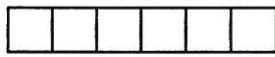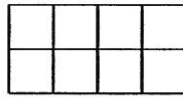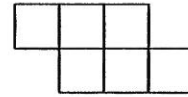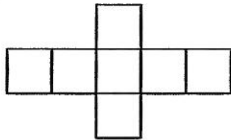
f)

Q2 Calculate the perimeter of each rectangle.

a)
2 cm
5 cm

b)
8 cm
7 cm

c)
12 cm
8 cm

d)
8 cm
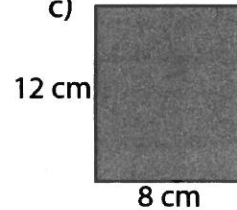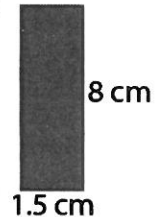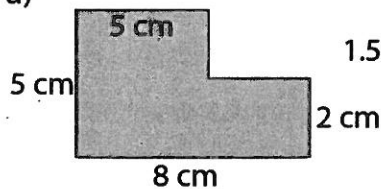1.5 cm

Q3 Calculate the perimeter of each composite shape.

a)
5 cm
5 cm
2 cm
8 cm

b)
1.5 m
6 m
3 m
6 m

c)
22 cm
5.5 cm
12 cm
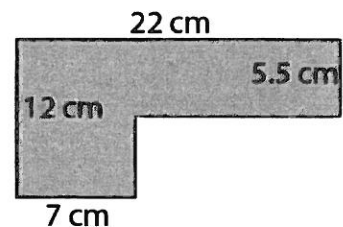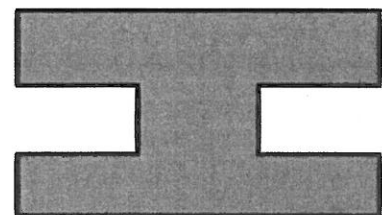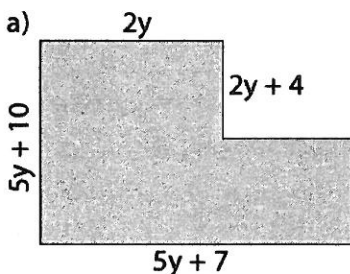7 cm
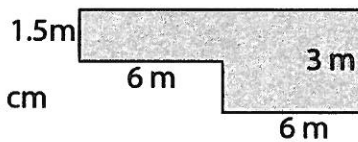
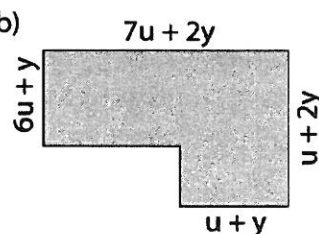**Q4** The perimeter of this shape = 40 cm. Determine two possible sets of measurements.

Q5 Write a simplified expression for the perimeter of each shape.
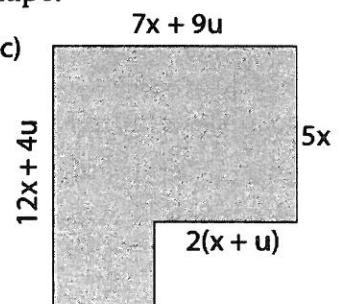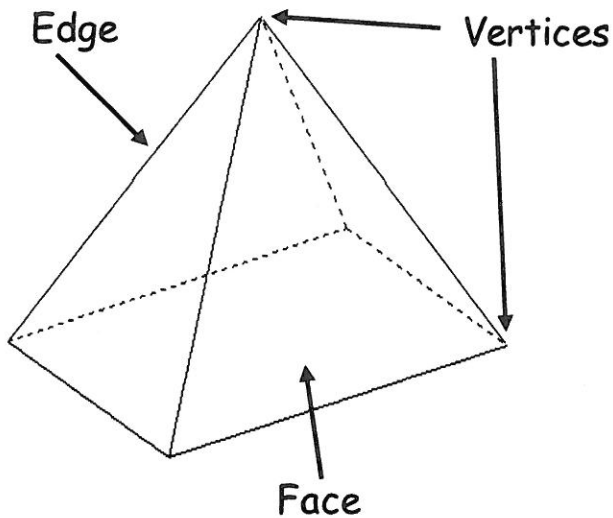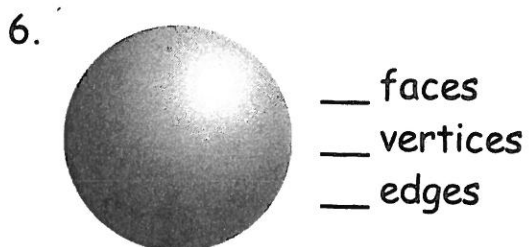
a)
2y
5y + 10
2y + 4
5y + 7

b)
7u + 2y
6u + y
u + 2y
u + y

c)
7x + 9u
12x + 4u
5x
2(x + u)

Edge

Vertices

Pyramid
<u>5</u> faces
<u>5</u> vertices
<u>8</u> edges

Face

Look at the 3d shapes on your table. Count the faces, vertices and edges for each.

1. __ faces
    __ vertices
    __ edges

2. __ faces
    __ vertices
    __ edges

3. __ faces
    __ vertices
    __ edges

4. __ faces
    __ vertices
    __ edges

5. __ faces
    __ vertices
    __ edges

6. __ faces
    __ vertices
    __ edges
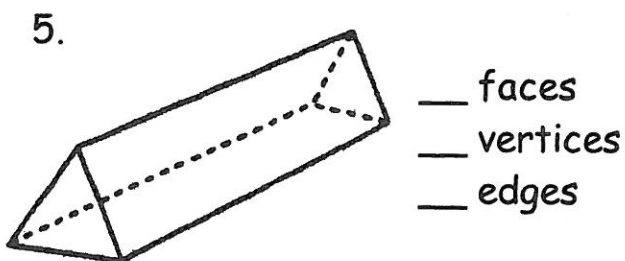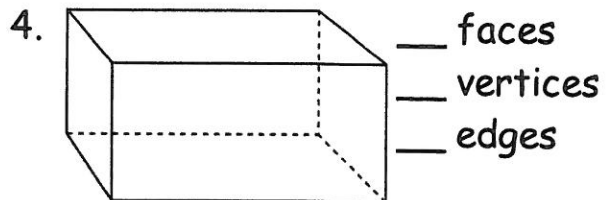
ANGLES

1. Use a protractor to measure these angles accurately

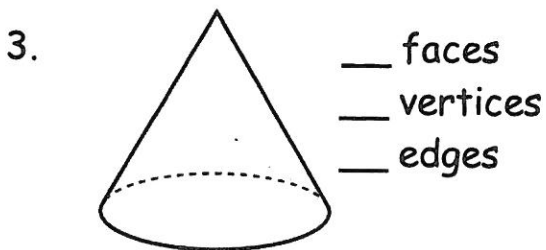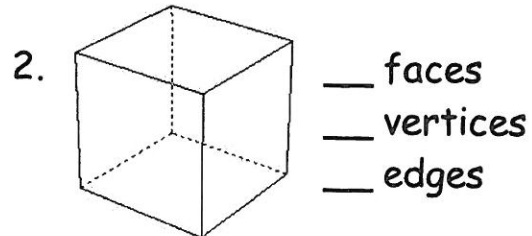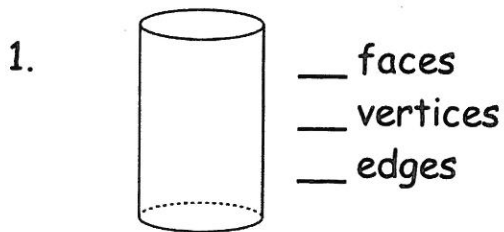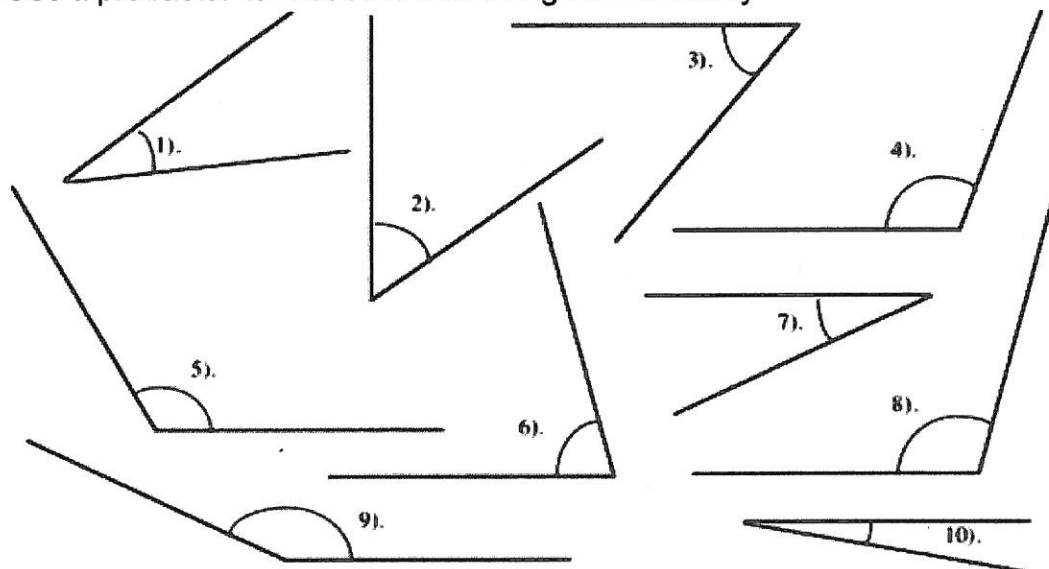2. Calculate the size of each angle marked by a letter. Give a reason for your answer.
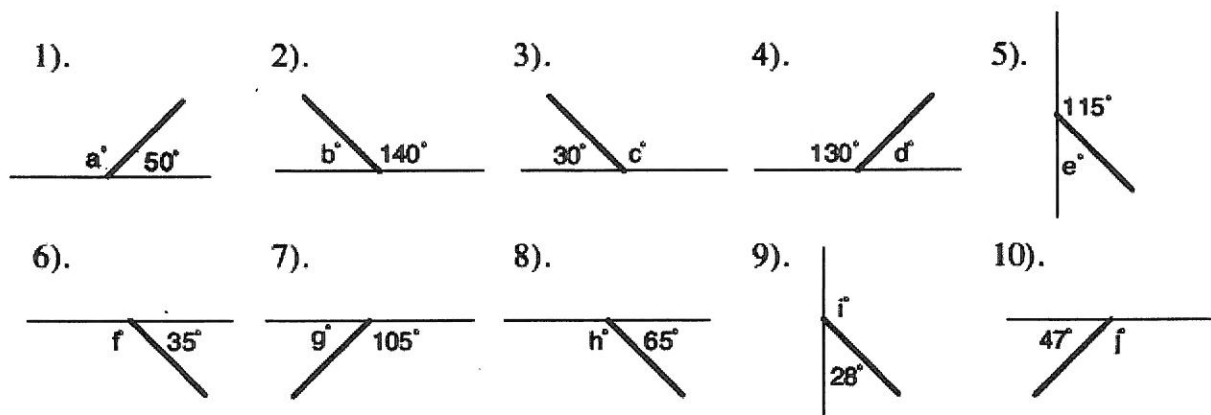
1). a° 50°

2). b° 140°

3). 30° c°

4). 130° d°

5). 115° e°

6). f° 35°

7). g° 105°

8). h° 65°

9). i° 28°

10). 47° j°

3. Find the size of each angle marked by a letter. Give a reason for your answer.

1). 72° a° 154°

2). b° 117°

3). c° 76° 87° 135°

4). 83° d° 54°

5). 74° 136° e° 97°

6). g° 64° f° 35° 145°

7). 46° h° i° 44° 61°

8). m° 45° l° k° 66° 32° 82°

9). q° p° r° 38° 43°

10). t° r° s° 12° u° 73°

4. Find the size of each angle marked by a letter. Give a reason for your answer.

1). 45° a°

2). 120° b°

3). 135° c°

4). 25° d°

5). e° 37°

6). 130° g° f°

7). h° i° 40°

8). 60° k° j°

9). m° n° 145°

10). p° 115° q°
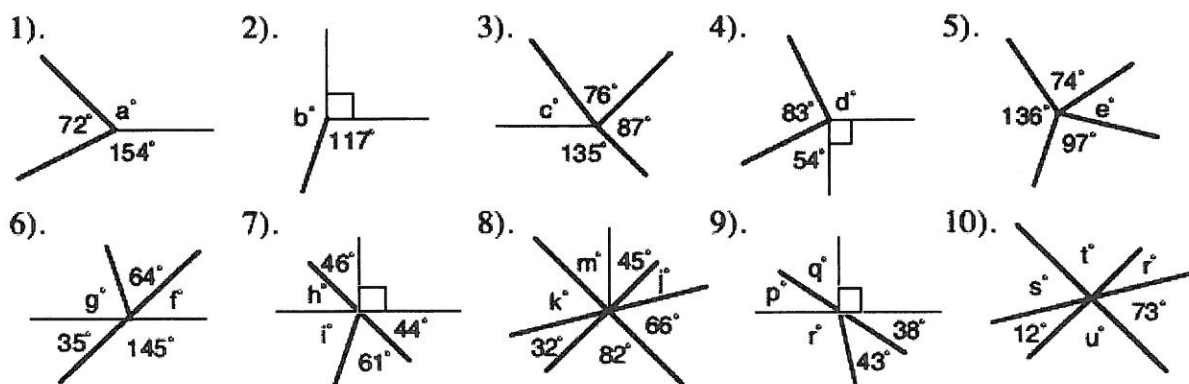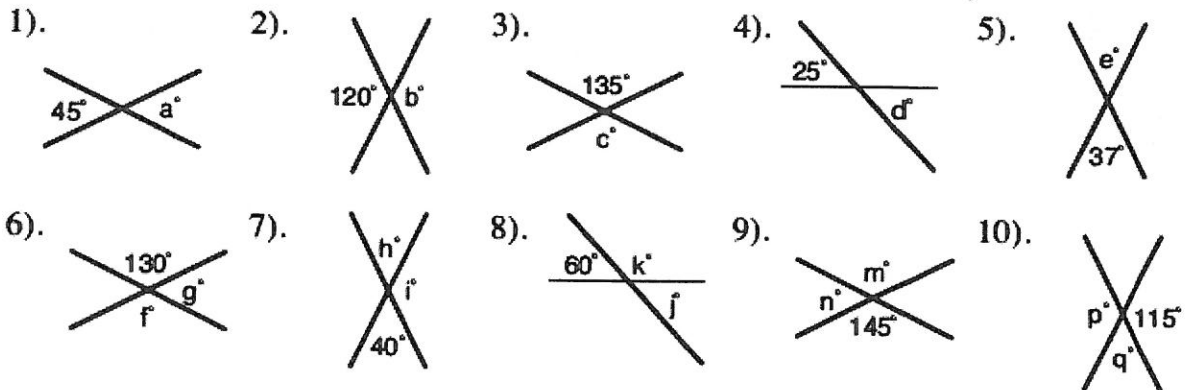
5. Find the size of the angles marked by a letter

1). 80° 60° a°

2). 45° b° 70°

3). c° 35° 20°

4). 35° 82° d°

5). 52° e° 86°

6). f° 37° 78°

7). g° 87 19°

8). h° 29° 11°

9). i° 55° 77

10). j° 76° 64°

6. Find the size of each angle marked by a letter.

1). 75° 130° a° 85°

2). b° 126° 59° 64°

3). c° 154° 58°

4). 31° 143° 75° d° e°

5). 69° 65° f° g° 73°

6). 97° i° h° 52°

7). 123° 51° k° j° 85°

8). 131° m° 103°

9). n° 83°

9). r° p° 113° 54° q° 80°

10). s° 36° t° 86° 53° u°
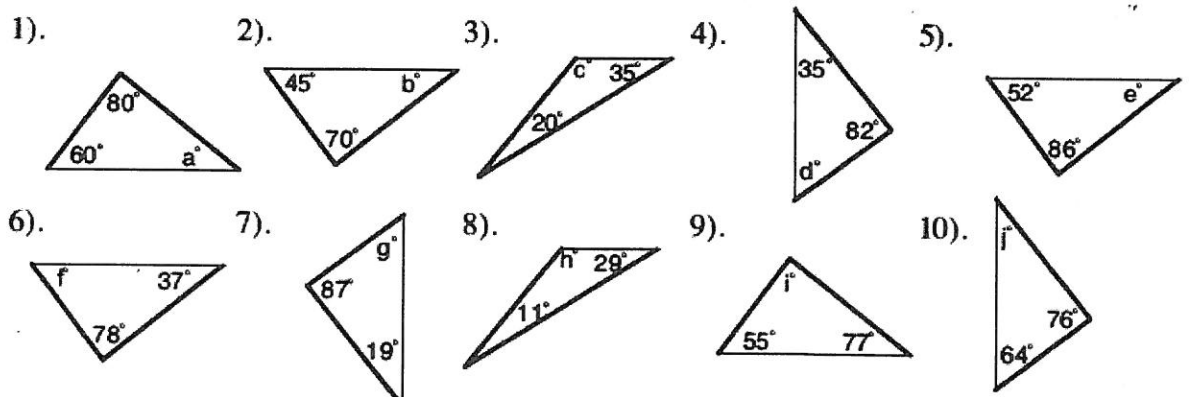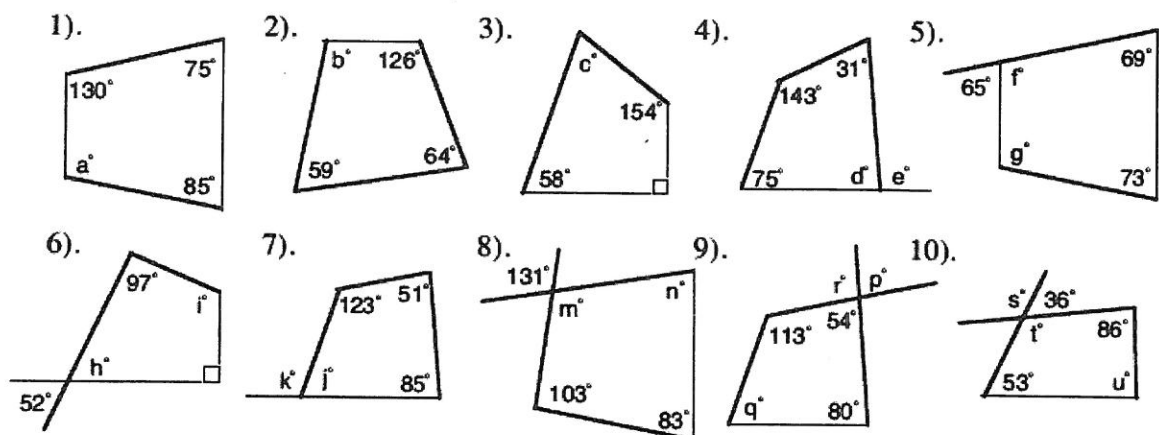
Ratio

Share the amount in the given ratio. You must show your working.

Amount	Ratio	Working	Answer
800	3 : 5		
77	6 : 1		
180	2 : 1 : 3		
45	2 : 3 : 4		
210	5 : 2		
60	5 : 3 : 4		
156	2 : 7 : 3		