Unit 1-4 First Year Test

Name: Oisín Aigaud **Teacher:**

Date:

Q1.

(a) Complete the table. 98% (97.5%)

Power of 2	Expanded power of 2	Answer
2^1	2	2
2^2	2 × 2	4
2^3	2 × 2 × 2	8
2^4	2x2x2x2	16
2^5	2x2x2x2x2	32
2^6	2x2x2x2x2x2	64
2^7	2x2x2x2x2x2x2	128
2^8	2x2x2x2x2x2x2x2	256
2^9	2x2x2x2x2x2x2x2x2	512

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(b) Insert operators to make each calculation below correct.

Use the operators [+], [−], and [×].

Example: 3 [ ] 2 [ ] 5 = 13

Answer: 3 [+] 2 [×] 5 = 13

(i) 3 [−] 2 [+] 5 = 6

(ii) 3 [×] 2 [−] 5 = 1

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Q2. The universal set, $U = \{ 1, 2, 3, 4, 5, 7, 10, 11, 13, 17, 19, 20 \}$.
A is the set of prime numbers between 1 and 20. B is the set of factors of 20.

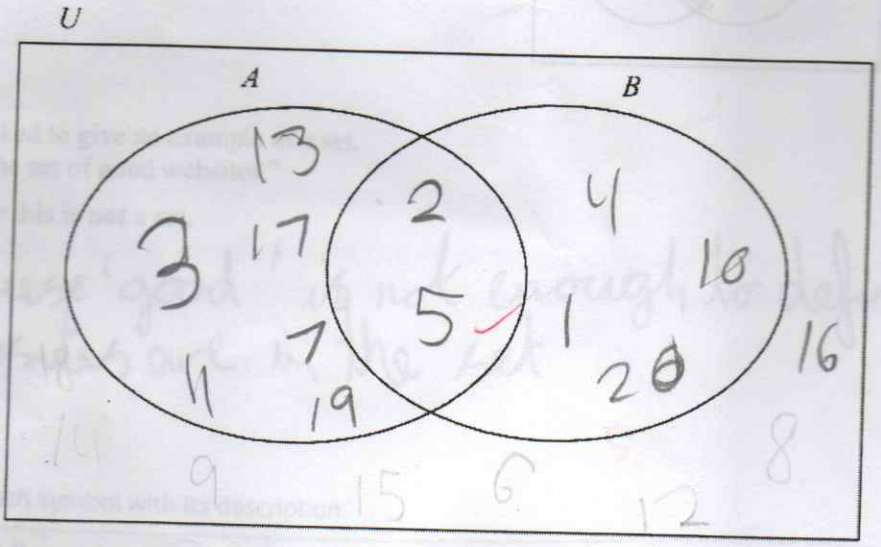
(a) List the elements of the set A.

$A = \{ 2, 3, 5, 7, 11, 13, 17, 19 \}$

(b) List the elements of the set B.

$B = \{ 1, 2, 4, 5, 10, 20 \}$

(c) Fill in the Venn diagram below placing all elements of U in the correct regions.



(d) List the elements of $A \cap B$.

$A \cap B = \{ 2, 5 \}$

(e) Complete the sentence below.

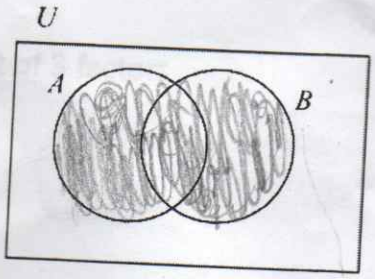
If an element is in the region $A \cap B$, it has two properties: it is a prime number and it is a factor of 20.

(f) The number 16 is added to the universal set. Place 16 in the correct region in the Venn diagram in part **(c)** and explain why you placed it there.

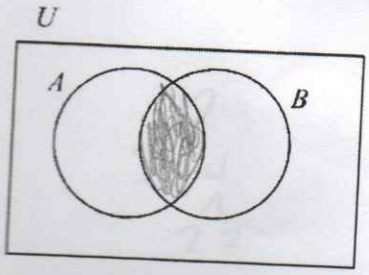
Reason: It is neither a prime number or factor of 20

Q3.

(a) (i) In the Venn diagram, shade the set $A \cup B$.



(i) In the Venn diagram, shade the set $A \cap B$.



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(b) John was asked to give an example of a set.
He said: "The set of good websites."
Explain why this is **not** a set.

Because 'good' is not enough to define which websites are in the set

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(c) Match each symbol with its description.

1. $A \cap B$	a. The null set
2. $A \cup B$	b. The number of elements in set A is 8
3. $7 \in A$	c. 7 is not an element of A
4. $7 \notin A$	d. A is a subset of B
5. $A \not\subset B$	e. 7 is an element of A
6. $A \subset B$	f. Intersection of A and B
7. $\varnothing$	g. A is not a subset of B
8. $\#A = 8$	h. Union of A and B

1	2	3	4	5	6	7	8
F	H	E	C	G	D	A	B

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Q4. Evaluate the following;

(a) $-2(4) = -8$ ✓	(b) $-7(-5) = 35$ ✓	(c) $-1(1) = -1$ ✓
(d) $(-6) \div 3 = -2$ ✓	(e) $(-14) \div (-2) = 7$ ✓	

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Q5.

(a) Write 36 as a product of 2 factors and as a product of 3 factors

2X18, 9X2X2 5

(b) Write the highest common factor of 20 and 50

10 5

(c) Write 12 as a product of prime factors

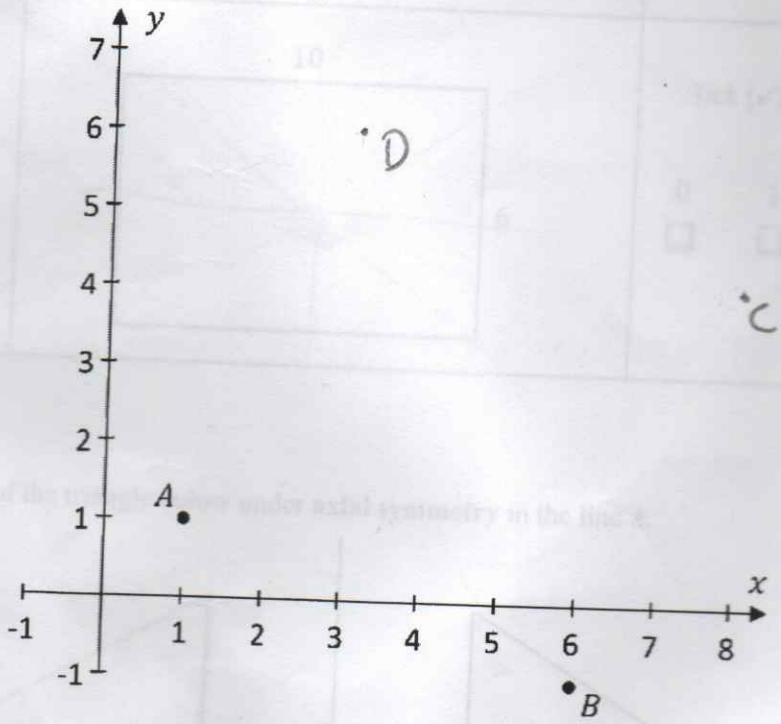
3X2X2 5

12
3 4
2 2

Q6. 15

A, B, C, and D are four points in the co-ordinate plane.

(a) **(i)** The points A and B are shown on the co-ordinate diagram below.
Plot and **label** the points $C(8,4)$ and $D(3,6)$ on the same co-ordinate diagram.



(ii) **Write** the co-ordinates of the points A and B in the spaces below.
The co-ordinates of the points C and D are already given.

$A =$ (1, 1) $B =$ (6, -1) $C = (8,4)$ $D = (3,6)$

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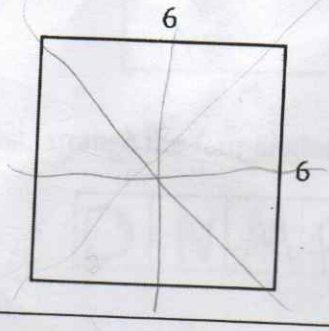
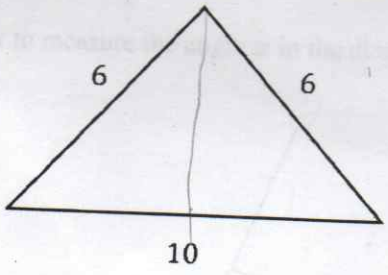
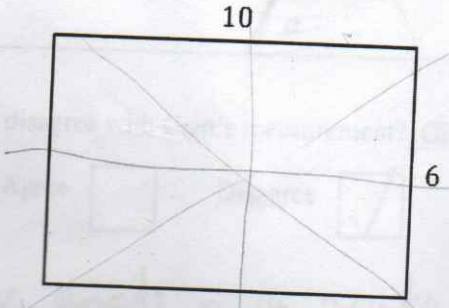
Q7. (a)

Fill in the table below to show the number of **axes of symmetry** of each shape.

Shape	Diagram	Number of axes of symmetry
Square		Tick (✓) **one** box only: 0 ☐ 1 ☐ 2 ☐ 4 ☑
Isosceles Triangle		Tick (✓) **one** box only: 0 ☐ 1 ☑ 2 ☐ 4 ☐
Rectangle		Tick (✓) **one** box only: 0 ☐ 1 ☐ 2 ☐ 4 ☑

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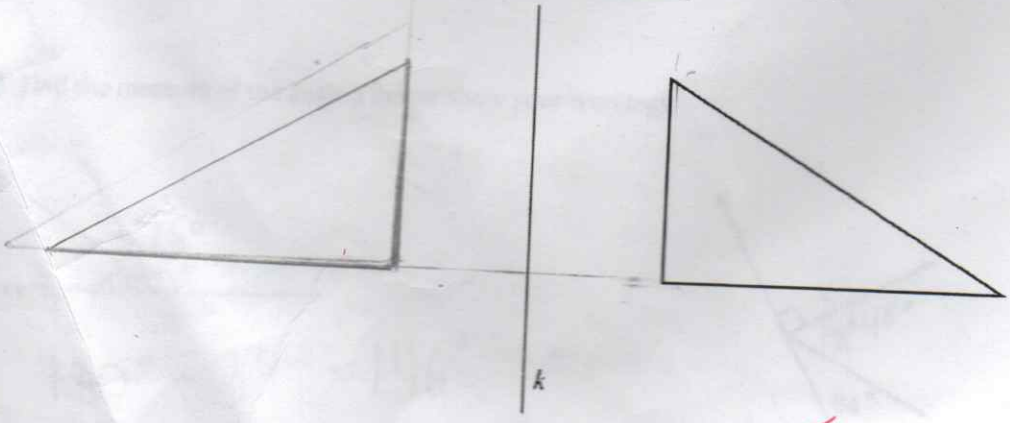
(b)

Draw the image of the triangle below under **axial symmetry** in the line k.



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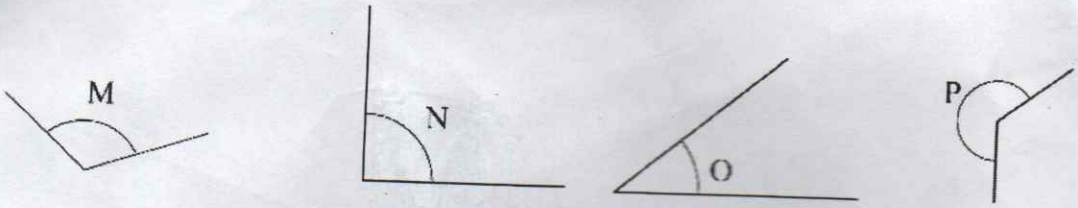
27mm 18mm 46mm

~~0~~ 7 2

Q8.

(a) The four angles ∠M, ∠N, ∠O, and ∠P are shown in the diagrams below.



Starting with the smallest, arrange the four angles in order of magnitude.

O	N	M	P

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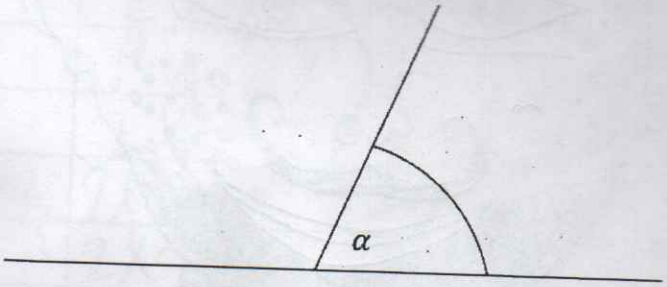
(b)

Cian used a protractor to measure the angle α in the diagram below.
His answer was 100°.

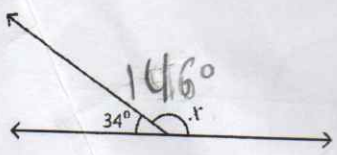


Do you agree or disagree with Cian's measurement? Give a reason for your answer.

Agree ☐ Disagree ☑

Reason The angle α is acute and so cannot be more than 89.99... 5

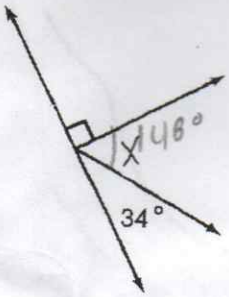
(c) Find the measure of the angle x below, show your workings.



180 − 34 = 146

180° − 34° = 146°

x = 146°



180° − 90° − 34°

180 − 90 = 90

90 − 34 = 56

x = 56°

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