

Cycle 1 mock exam preparation: aiming for a grade 9 (higher)

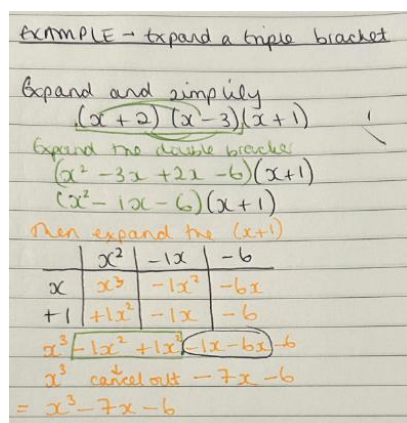
W/C Monday 22 September

Revision timetable:

	Monday 22 September	Tuesday 23 September	Wednesday 24 September	Thursday 25 September	Friday 26 September	Saturday 27 September	Sunday September 28
Aiming for a grade 9: higher	<ul style="list-style-type: none"> Collecting like terms with single and double brackets 	<ul style="list-style-type: none"> All factorising (linear, quadratic and cubic) 	<ul style="list-style-type: none"> Solving linear and quadratic equations 	<ul style="list-style-type: none"> Order of operations, integer powers / roots 	<ul style="list-style-type: none"> Review of percentages including reverse percentages 	<ul style="list-style-type: none"> HCF, LCM, product of primes (with problem solving) 	<ul style="list-style-type: none"> Angle facts, parallel lines and polygons

Notes

- 20 marks = 20 minutes (time yourself!)
- Show all of your working out
- Use the link to CorbettMaths to look at videos to support



5. Expand and simplify $(2x + 1)(5x - 9)$

(2 marks)

6. Expand and Simplify $(x + 2)(x + 4)(x + 1)$

1. Expand and Simplify $6(y + 3) - 5(y - 4)$

(2 marks)

2. Expand and Simplify $4(2y - 7) - 3(5y - 3)$

(3 marks)

7. Expand and Simplify $(x + 3)(x - 1)^2$

3. Expand $2x^2(4x - 9)$

(3 marks)

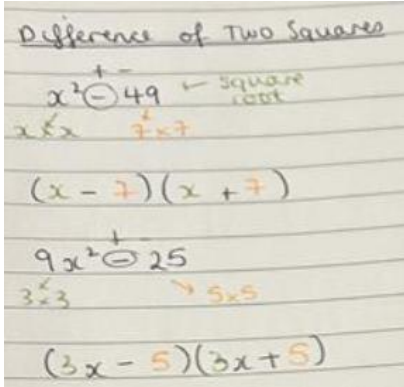
8. Expand and Simplify $(2x - 3)(x - 2)(3x - 1)$

4. Expand and simplify $(2p - 3)(p - 5)$

(2 marks)

(3 marks)

(2 marks)



6. Factorise $n^2 + 3n - 28$

(2 marks)

7. Factorise $2x^2 + 5x + 2$

(2 marks)

8. Factorise $2y^2 + 7y - 15$

(2 marks)

9. Factorise $5x^2 - 13x - 6$

(2 marks)

10. A quadratic expression, $5x^2 + ax + 9$, can be factorised.
 a is an integer.

How many possible values are there for a ?

(2 marks)

(3 marks)

1. Factorise fully $30a^2 + 40ab$

(2 marks)

2. Factorise fully $6x^2 - 4xy$

(2 marks)

3. Factorise $x^2 - 49$

(1 marks)

4. Factorise $4x^2 - 100$

5. Factorise $x^2 - 6x - 27$



EXAMPLES

① Solve $x^2 - 5x - 14 = 0$
 $(x-7)(x+2) = 0$
 $x-7=0 \quad x+2=0$
 $x=7 \quad x=-2$

② Solve $x^2 + 7x = 18$
 $x^2 + 7x - 18 = 0$
 $(x+9)(x-2) = 0$
 $x+9=0 \quad x-2=0$
 $x=-9 \quad x=2$

6. Solve $m^2 + 13m + 40 = 0$

(3 marks)

7. Solve $x^2 + 10x - 24 = 0$

1. Solve $\frac{y}{3} - 5 = 4$

(2 marks)

2. Solve $\frac{d+3}{4} = 5$

(3 marks)

8. Solve $5x^2 + 19x - 4 = 0$

3. Solve $24 = 4(2x - 5)$

(2 marks)

9. Solve $y^2 - 6y = 27$

(3 marks)

4. Solve $10 - 2s = s - 8$

(2 marks)

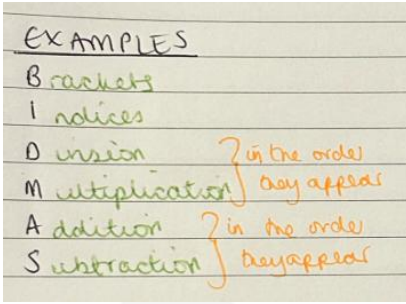
10. Solve $x^2 = 8x - 15$

(2 marks)

5. Solve $b^2 - 10b - 24 = 0$

(2 marks)

(2 marks)



7. An estate agent is paid a weekly wage of £750 **plus** a bonus of £100 for each house sold.

Last week, the estate agent sold two houses.
Their pay is found by working out $750 + 100 \times 2$

Taniya thinks that the pay will be £1700

Explain why Taniya is wrong.

1. Work out $3 + 10 \times 2^3$

(2 marks)

(2 marks)

2. Work out $2 + (5 + 3)^2$

(2 marks)

8. Work out $(513 \div 3) + (21 \times 13)$

3. Write brackets () in these statements to make each statement correct. You may use more than one pair of brackets.

a) $2 + 7 \times 3 + 4 = 51$

(1 mark)

(2 marks)

b) $9 - 7 \times 3 + 5 = 16$

(1 mark)

9. Given

$$a = 11 - 3^2$$

$$b = \frac{60}{2+3}$$

$$c = 18 - 3 \times 2 + 1$$

Work out the value of $a + b + c$

4. Work out $\sqrt{81} - (9 - 7) \times 3$

(3 marks)

5. Work out $\sqrt[3]{1000} - (11 - 3 \times 2)^2$

(3 marks)

(4 marks)

EXAMPLES

$$\text{Percentage change} = \frac{\text{change}}{\text{original}} \times 100$$

7. A car is travelling at 40 kilometres per hour.
The car increases its speed to 56 kilometres per hour.

Calculate the percentage increase in the speed of the car.

(3 marks)

1. Logan has two tubs of beads.

5% of the 600 beads in Tub A are yellow.

4% of the 900 beads in Tub B are yellow.

Work out the total number of yellow beads in the tubs.

8. A box contains red and yellow marbles.
40% of the marbles in the box are yellow.

There are 80 yellow marbles in the box.

Work out the total number of marbles in the box.

(2 marks)

9. Jacob buys a watch costing £84
This cost includes VAT at a rate of 20%.

How much is the watch without VAT?

(4 marks)

2. Richard gets a bonus of 30% of £130
Connor gets a bonus of £40

Work out the difference between the bonus Richard gets and the bonus Connor gets

(2 marks)

(3 marks)

- 10 A cafe sells 3 types of hot drinks: coffee, tea or hot chocolate.

On Tuesday morning, the cafe sold 96 coffees.
This was 60% of the total number of hot drinks sold.

Work out the total number of hot drinks sold on Tuesday morning.

6. Peter's weight decreases from 80kg to 64kg.

Calculate the percentage decrease in Peter's weight.

(3 marks)

(3 marks)

4. Find the highest common factor (HCF) of 60 and 114

EXAMPLES
Find the HCF and LCM of 24 and 30

24	30	$24 = 2 \times 2 \times 2 \times 3$
^	^	$30 = 2 \times 3 \times 5$
(2) 12	(2) 15	
^	^	HCF = $2 \times 3 = 6$
(2) 6	(3) 5	(find the pairs)
^		
(2) 3		

LCM = $2 \times 3 \times 2 \times 2 \times 5 = 120$
2 pairs x 4 factors

1. Write 240 as a product of its prime factors.

(3 marks)

5. Find the lowest common multiple (LCM) of 120 and 150

(2 marks)

3. Two buses, bus A and bus B, both use the same bus stop.

Bus A runs every 10 minutes.
 Bus B runs every 14 minutes.

Both buses are at the bus stop at 11 am.

What time will both buses next both be at the bus stop.

(2 marks)

(3 marks)

6. $648 = 2^3 \times 3^4$ $540 = 2^2 \times 3^3 \times 5$

(a) Write down the highest common factor (HCF) of 648 and 540.

(b) Find the lowest common multiple (LCM) of 648 and 540.

(2 marks)

8. $A = 2^2 \times 3 \times 5^2$ $B = 2^3 \times 3^2 \times 7$

(a) Write down the highest common factor (HCF) of **A** and **B**.

(3 marks)

(b) Find the lowest common multiple (LCM) of **A** and **B**.

(3 marks)

8. Kenny is thinking of two numbers **greater than 10**.

He says:

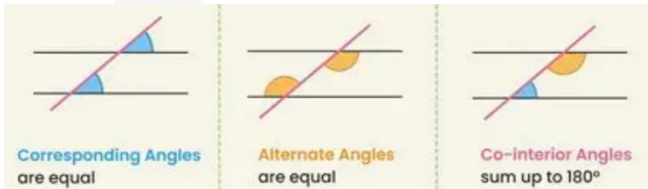
"The highest common factor (HCF) of my two numbers is 7
The lowest common multiple (LCM) of my two numbers is 84"

Write down the two numbers that Kenny is thinking of.

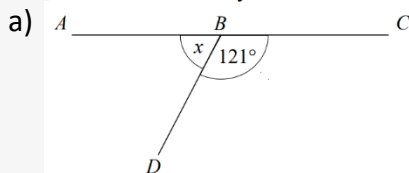
Regular Polygons

$$\text{Exterior angle} = \frac{360}{n} \quad \text{No of sides} = \frac{360}{\text{ext angle}}$$

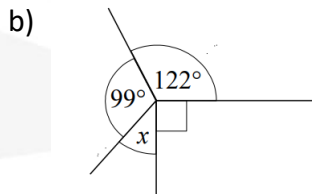
(where n = number of sides)



1. Work out the size of the angle marked x .
Give a reason for your answer.

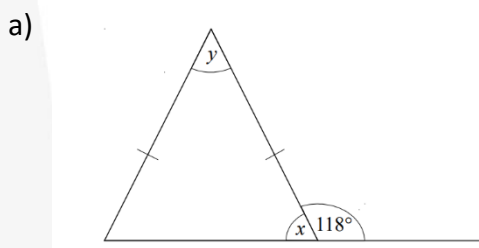


(2 marks)

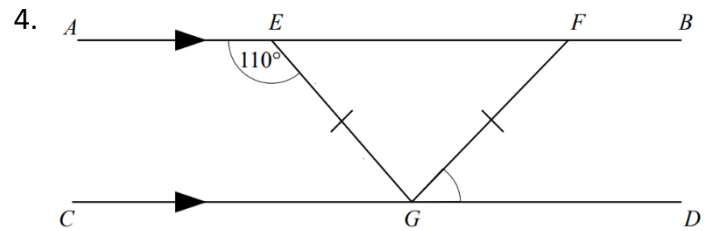


(2 marks)

2. Work out the size of the missing angles. Give reason for your answers.



(3 marks)

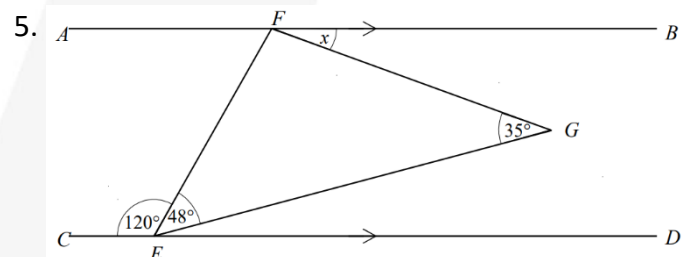


AB and CD are parallel lines.
 EFG is an isosceles triangle

Angle $AEG = 110^\circ$

Find the size of angle FGD .
Give a reason for each stage of your working.

(3 marks)



AB and CD are parallel.

Find the size of angle x .
Give a reason for each stage of your working.

(3 marks)

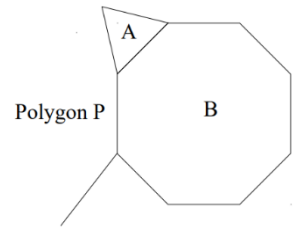
6. The size of each interior angle in a regular polygon is 165° .
Work out how many sides the polygon has.

9. Shape A is a regular triangle.
Shape B is a regular octagon.

Another regular polygon,
P, is shown on the diagram.

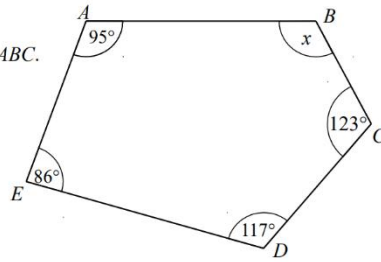
How many sides does polygon P have?

You must show your working.



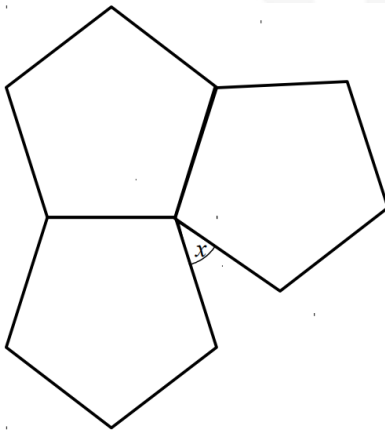
(2 marks)

7. $ABCDE$ is a pentagon.
Work out the size of angle ABC .



(2 marks)

8.



(4 marks)

The diagram shows three regular pentagons meeting at a point.

Work out the size of the angle marked x .
You must show all your working.

(3 marks)