

FACTORS, MULTIPLES AND PRIMES

Pearson Edexcel - Tuesday 19 May 2020 - Paper 1 (Non-Calculator) Higher Tier

1.

20 Show that $\frac{\sqrt{180} - 2\sqrt{5}}{5\sqrt{5} - 5}$ can be written in the form $a + \frac{\sqrt{5}}{b}$ where a and b are integers.

(Total for Question 20 is 4 marks)

Pearson Edexcel – Thursday 4 June 2020 - Paper 2 (Calculator) Higher Tier

2.

1 (a) Write 84 as a product of its prime factors.

.....
(2)

(b) Find the lowest common multiple (LCM) of 60 and 84

.....
(2)

.....
(Total for Question 1 is 4 marks)
.....

Pearson Edexcel – Monday 8 June 2020 - Paper 3 (Calculator) Higher Tier

3.

20 Here is a list of five numbers.

$$98^{23} \quad 98^{44} \quad 98^{73} \quad 98^{88} \quad 98^{91}$$

Find the lowest common multiple of these five numbers.

(Total for Question 20 is 1 mark)

Pearson Edexcel - Tuesday 11 June 2019 - Paper 3 (Calculator) Higher Tier

4.

- 18 (a) Show that $(2x + 1)(x + 3)(3x + 7)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a , b , c and d are integers.

(b) Solve $(1 - x)^2 < \frac{9}{25}$

(3)

(3)

(Total for Question 18 is 6 marks)

Pearson Edexcel - Tuesday 6 November 2018 - Paper 1 (Non-Calculator) Higher Tier

5.

10 (a) Simplify $\frac{x-1}{5(x-1)^2}$

(1)

(b) Factorise fully $50 - 2y^2$

(2)

(Total for Question 10 is 3 marks)

Pearson Edexcel - Thursday 24 May 2018 - Paper 1 (Non-Calculator) Higher Tier

6.

15 (a) Factorise $a^2 - b^2$

(1)

(b) Hence, or otherwise, simplify fully $(x^2 + 4)^2 - (x^2 - 2)^2$

(3)

(Total for Question 15 is 4 marks)

Pearson Edexcel - Thursday 24 May 2018 - Paper 1 (Non-Calculator) Higher Tier

7.

17 Simplify fully $\frac{3x^2 - 8x - 3}{2x^2 - 6x}$

(Total for Question 17 is 3 marks)

Pearson Edexcel - Thursday 2 November 2017 - Paper 1 (Non-Calculator) Higher Tier

8.

1 Write 36 as a product of its prime factors.

(Total for Question 1 is 2 marks)

Pearson Edexcel - Wednesday 8 November 2017 - Paper 3 (Calculator) Higher Tier

9.

13 Write $x^2 + 6x - 7$ in the form $(x + a)^2 + b$ where a and b are integers.

(Total for Question 13 is 2 marks)

Pearson Edexcel - Thursday 25 May 2017 - Paper 1 (Non-Calculator) Higher Tier

10.

2 Express 56 as the product of its prime factors.

(Total for Question 2 is 2 marks)

Pearson Edexcel - Thursday 25 May 2017 - Paper 1 (Non-Calculator) Higher Tier

11.

- 10 Show that $(x + 1)(x + 2)(x + 3)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a, b, c and d are positive integers.

(Total for Question 10 is 3 marks)

Pearson Edexcel - Specimen Papers Set 2 - Paper 1 (Non-Calculator) Higher Tier

12.

- 1 (a) Factorise $y^2 + 27y$

.....
(1)

- (b) Simplify $(t^3)^2$

.....
(1)

- (c) Simplify $\frac{w^9}{w^4}$

.....
(1)

(Total for Question 1 is 3 marks)

Pearson Edexcel - Sample Paper 3 - (Calculator) Higher Tier

13.

6 Liz buys packets of coloured buttons.

There are 8 red buttons in each packet of red buttons.

There are 6 silver buttons in each packet of silver buttons.

There are 5 gold buttons in each packet of gold buttons.

Liz buys equal numbers of red buttons, silver buttons and gold buttons.

How many packets of each colour of buttons did Liz buy?

.....packets of red buttons

.....packets of silver buttons

.....packets of gold buttons

(Total for Question 6 is 3 marks)

Pearson Edexcel - Thursday 4 June 2015 - Paper 1 (Non-Calculator) Higher Tier

14.

9 John buys some boxes of pencils and some packets of pens for people to use at a conference.

There are 40 pencils in a box.

There are 15 pens in a packet.

John gives one pencil and one pen to each person at the conference.

He has no pencils left.

He has no pens left.

How many boxes of pencils and how many packets of pens did John buy?

..... boxes of pencils

..... packets of pens

(Total for Question 9 is 3 marks)

Pearson Edexcel - Friday 13 June 2014 - Paper 2 (Calculator) Higher Tier

15.

14 Ali is planning a party.

He wants to buy some cakes and some sausage rolls.

The cakes are sold in boxes.

There are 12 cakes in each box.

Each box of cakes costs £2.50

The sausage rolls are sold in packs.

There are 8 sausage rolls in each pack.

Each pack of sausage rolls costs £1.20

Ali wants to buy more than 60 cakes and more than 60 sausage rolls.

He wants to buy exactly the same number of cakes as sausage rolls.

What is the least amount of money Ali will have to pay?

£.....

(Total for Question 14 is 5 marks)

Pearson Edexcel - Tuesday 11 June 2013 - Paper 1 (Non-Calculator) Higher Tier

16.

5 Write 525 as a product of its prime factors.

.....
(Total for Question 5 is 3 marks)

Pearson Edexcel - Tuesday 11 June 2013 - Paper 1 (Non-Calculator) Higher Tier

17.

9 Matt and Dan cycle around a cycle track.

Each lap Matt cycles takes him 50 seconds.

Each lap Dan cycles takes him 80 seconds.

Dan and Matt start cycling at the same time at the start line.

Work out how many laps they will each have cycled when they are next at the start line together.

Matt..... laps

Dan..... laps

(Total for Question 9 is 3 marks)

Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

18.

14. The table shows six expressions.
 n is a positive integer.

$2n - 3$	$3n - 2$	$3(n + 4)$	$4n + 1$	$4(3n + 1)$	$2n + 1$
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- (a) From the table, write the expression whose value is

(i) always even

.....

(ii) always a multiple of 3

.....

(2)

- (b) From the table, write the expression which is a factor of $4n^2 - 1$

.....

(1)

(Total 3 marks)

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

19.

15. Express 180 as a product of its prime factors.

.....

(Total 3 marks)

OCR GSCE – Thursday 5 November 2020 – Paper 5 (Non-Calculator) Higher Tier

20.

- 1 Write 75 as a product of its prime factors.

..... [2]

OCR GSCE – Thursday 7 June 2018 – Paper 5 (Non - Calculator) Higher Tier

21.

- 15 n is a positive integer.

Prove that $13n + 3 + (3n - 5)(2n + 3)$ is a multiple of 6.

[4]

22.

3 Andrew is thinking of a number.

- It is between 1 and 150.
- It is one more than a square number.
- It is three less than a cube number.
- It is not a prime number.

What is Andrew's number?

You must show all your reasoning.

..... [4]

24.

- 17 Here are two methods to make a 4-digit code.
Codes can have repeated digits.

Method A

For the first two digits use an odd number between 30 and 100
For the last two digits use a multiple of 11

Method B

Use four digits in the order even odd even odd
Do **not** use the digit zero

Which method gives the **greater** number of possible codes?

You **must** show your working.

[3 marks]

Answer _____

25.

26 (a) $0.\dot{7} = \frac{7}{9}$

Use this fact to show that $0.0\dot{7} = \frac{7}{90}$

[1 mark]

26 (b) Using part (a) or otherwise, convert $0.2\dot{7}$ to a fraction.
Give your answer in its simplest form.

[3 marks]

Answer _____

26.

26

$$a^2 - b^2 \equiv (a + b)(a - b)$$

a and b are positive whole numbers with $a > b$

$a^2 - b^2$ is a **prime** number.

Why are a and b consecutive numbers?

[2 marks]

AQA GCSE – Sample Paper 3 (Calculator) Higher Tier

27.

12 Tick whether each statement is true or false.
Give a reason for your answer.

12 (a) When $x^2 = 16$ the **only** value that x can be is 4

[1 mark]

True False

Reason _____

12 (b) When n is a positive integer, the value of $2n$ is **always** a factor of the value of $20n$.

[1 mark]

True False

Reason _____

12 (c) When y is positive, the value of y^2 is **always** greater than the value of y .

[1 mark]

True False

Reason _____

