

GCSE Exam Questions Primes, Odds and Evens

Question 1. (AQA June 2004 Intermediate Paper 2 Calculator OK)

(a)  $k$  is an even number.

Jo says that  $\frac{1}{2}k + 1$  is always even.

Give an example to show that Jo is wrong.

[1 mark]

(b) The letters  $a$  and  $b$  represent prime numbers.

Give an example to show that  $a + b$  is **not** always an even number.

[1 mark]

Question 2. (AQA June 2006 Intermediate Paper 2 Calculator OK)

Hassan says



When you square a positive number the answer is always bigger than the original number.

For example

$$2.5^2 = 6.25 \text{ and } 6.25 \text{ is bigger than } 2.5$$

Find an example to show that Hassan is wrong.

You **must** show your working.

[2 marks]

Question 3. (AQA June 2003 Intermediate Paper 1 NO Calculator)

$p$  is an odd number.

Explain why  $p^2 + 1$  is always an even number.

[2 marks]

Question 4. (AQA June 2004 Intermediate Paper 1 NO Calculator)

Tom, Sam and Matt are counting drum beat.

Tom hits a snare drum every 2 beats.

Sam hits a kettle drum every 5 beats.

Matt hits a bass drum every 8 beats.

They start by hitting their drums at the same time.

How many beats is it before Tom, Sam and Matt **next** hit their drums at the **same** time?

[2 marks]

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Question 5. (AQA November 2004 Intermediate Paper 2 Calculator OK)

P is a prime number.

Q is an odd number.

State whether each of the following is always odd or always even or could be either odd or even.

Tick the appropriate box.

(a)  $P(Q + 1)$

☐

Always odd

☐

Always even

☐

Could be either  
odd or even

(1 mark)

(b)  $Q - P$

☐

Always odd

☐

Always even

☐

Could be either  
odd or even

(1 mark)

Question 6. (AQA June 2003 Intermediate Paper 1 NO Calculator)

(a) Work out the value of

$$5^7 \div 5^4$$

[2 marks]

(b) a and b are prime numbers.

$$ab^3 = 54$$

Find the values of a and b.

[2 marks]

(c) Find the Highest Common Factor (HCF) of 54 and 135.

[2 marks]

Question 7. (AQA June 2005 Intermediate Paper 1 NO Calculator)

(a) Write 18 as the product of its prime factors.

[2 marks]

(b) What is the least common multiple (LCM) of 12 and 18?

[1 mark]

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Question 8. (AQA June 2005 Intermediate Paper 1 NO Calculator)

p and q are odd numbers.

(a) Is  $p + q$  an odd number, an even number or could it be either?

Tick the correct box.

☐

odd

☐

even

☐

either

[1 mark]

(b) Is  $pq$  an odd number, an even number or could it be either?

Tick the correct box.

☐

odd

☐

even

☐

either

[1 mark]

Question 9. (AQA November 2003 Intermediate Paper 1 NO Calculator)

P is an odd number.

Q is an even number.

(a) Explain why  $P + Q - 1$  is **always** an even number.

[2 marks]

(b) Alex says that  $P + Q - 1$  **cannot** be a prime number.  
Explain why Alex is wrong.

[1 mark]

Question 10. (AQA November 2003 Intermediate Paper 1 NO Calculator)

(a) You are given that

$$2x^3 = 250$$

Find the value of x.

[1 mark]

(b) Write 75 as the product of its prime factors.

[2 marks]

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Question 11. (AQA November 2003 Intermediate Paper 1 NO Calculator)

(a) Write 28 as the product of its prime factors.	(b) Find the least common multiple (LCM) of 28 and 42.
[2 marks]	[2 marks]

Question 12. (AQA November 2006 Intermediate Paper 1 NO Calculator)

You are given that $n = 2^2 \times 5$	
(a) Calculate $40n$ .	(b) Write $40n$ as a product of its prime factors.
[2 marks]	[2 marks]

Question 13. (AQA November 2003 Intermediate Paper 2 Calculator OK)

Show that the sum of <b>any</b> three consecutive integers is always a multiple of 3.
[3 marks]