Edexcel GCSE
Mathematics

Foundation/Higher Tier
Number: Integers

Information for students

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 9 questions in this selection.

Advice for students

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

Information for teachers

The questions in this document are taken from the 2009 GCSE Exam Wizard and include questions from examinations set between January 2003 and June 2009 from specifications 1387, 1388, 2540, 2544, 1380 and 2381.

Questions are those tagged as assessing "Integers" though they might assess other areas of the specification as well. Questions are those tagged as "Foundation/Higher" so could have (though not necessarily) appeared on either a Foundation, Intermediate or Higher tier paper.

GCSE Mathematics

Formulae: Foundation Tier

You must not write on this formulae page.

Anything you write on this formulae page will gain NO credit.

Area of trapezium = $(a + b)h$
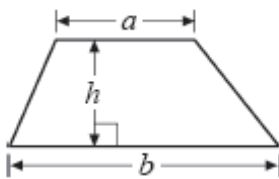
Volume of prism = area of cross section × length
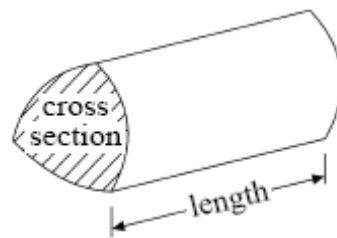
1. The cost of a compact disc holder is 25p.
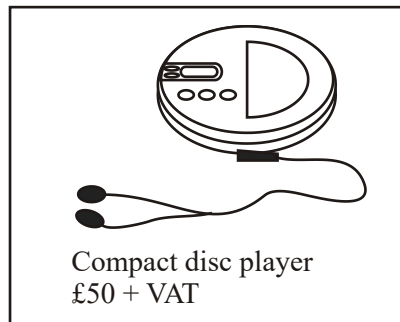John has £15 to spend.

(a) What is the greatest number of compact disc holders that John can buy for £15?

....

(3)

A compact disc player costs £50 plus 17½% VAT.

(b) Calculate the total cost of the compact disc player.

Compact disc player
£50 + VAT

£ ....

(3)
(Total 6 marks)

2. Jill says

"If you multiply any two prime numbers together, the answer will always be an odd number".

Write down an example to show that Jill is **wrong**.

(Total 2 marks)

3. Using the information that

$$19 \times 24 = 456$$

write down the value of

(a) 19×240

....
(1)

(b) 19×2.4

....
(1)

(c) $456 \div 190$

....
(1)
(Total 3 marks)

4.   Jamie goes on holiday to Florida.
The exchange rate is £1 = 1.70 dollars.

He changes £900 into dollars.

(a)   How many dollars should he get?

.... dollars

(2)

After his holiday Jamie changes 160 dollars back into pounds.
The exchange rate is still £1 = 1.70 dollars.

(b)   How much money should he get?
Give your answer to the nearest penny.

£ ....

(2)
(Total 4 marks)

5.   (a)   Work out the value of

   (i) 4^2

   ....

   (ii) $\sqrt{64}$

   ....

   (iii) 3×2^3

   ....

   (3)

   (b)   Work out

   (i) $-2 + 5$

   ....

   (ii) $-2 - 3$

   ....

   (2)
   (Total 5 marks)

6.   (a)   Work out £3.75 × 24

                                                                £ ....
                                                                                                (3)

        (b)   Divide £135 by 20

                                                                £ ....
                                                                                                (3)
                                                                                     (Total 6 marks)

7.   (a)   Find the Highest Common Factor (HCF) of 24 and 36

                                          ....
                                                                                                (1)

(b)   Write 96 as a product of its prime factors.

....

(2)
(Total 3 marks)

8.   Here is part of Mrs Cook's gas bill.

Gas Bill

New reading   6549 units

Old reading   5137 units
_____

Cost per unit 52p

Work out the **total** cost of the units of gas she used.

£ ....
(Total 4 marks)

9.　　The table shows some expressions.

n represents an odd number.

$2n$	$n - 2$	$n + 1$	$\dfrac{n}{2}$

Two of the expressions represent even numbers.

Put a cross in the boxes underneath these **two** expressions.

(Total 2 marks)

01. (a) £1 ÷ 25p = 100 ÷ 25 = 4
15 × 4 = 60   3

> *M1 Conversion of £ to p eg × 100 or 1500*
> *M1 (indep) 15 ÷ 25, 100 ÷ 25 = 4 (or 4 as a digit seen)*
> *A1 cao*

(b) eg 10%+5%+2.5%= £5 + £2.50 + £1.25
So VAT = £8.75
Total cost is £50 + £8.75
= £58.75   3

> *M1 5, 2.5(0), 1.25 or 17.5 ÷ 2, 50×17.5÷100 oe*
> *M1 "£8.75" + £50 where the "£8.75"has been derived*
> *from a percentage calculation*
> *OR M2 for 50 × 1.175 oe*
> *A1 cao*

[6]

02. 2 × 3 = 6   2

> *B2 for a correct example*
> *(B1 for correctly multiplying any two prime numbers*
> *together or for 2 × prime number not evaluated)*

[2]

03. (a) 4560   1

> *B1 cao*

(b) 45.6   1

> *B1cao*

(c) 2.4   1

> *B1 cao*

[3]

04. (a) 900 × 1.70 =1530   2

> *M1 900 × 1.7(0) or digits 153(0) seen*
> *A1 cao*

(b) 160 ÷ 1.70 =
£94.12 or
£94.11   2

> *M1 160 ÷ 1.7(0) or digits 941(....) seen*
> *A1 cao*

[4]

05. (a) (i) 16   1
B1 cao

(ii) 8   1
B1 cao

(iii) 24   1
B1 cao

(b) (i) 3   1
B1 cao

(ii) –5   1
B1 cao

[5]

06.   (a)

```
   375
    24  x
  ─────
  1500
  7500
  ─────
  9000
```

= 90.00   3

Grid (lattice multiplication) with top row 3, 7, 5:
- 2: (0/6), (1/4), (1/0)
- 4: (1/2), (2/8), (2/0)
- bottom: 0, 0, 0
- left: 9

300	70	5	
6000	1400	100	20
1200	280	20	4

6000 + 1400 + 100 + 1200 + 280 + 20 = 9000
M1 for a complete method with relative place value correct,
condone 1 multiplication error, addition not necessary
A1 for 9000
A1 (dep on M1) for correct conversion of their total into £s
or
M1 for a completed grid with not more than 1 multiplication
error, addition not necessary
A1 for 9000
A1 (dep on M1) for correct conversion of their total into £s
or

M1 for sight of a complete partitioning method, condone
1 multiplication error, final addition not necessary
A1 for 9000
A1 (dep on M1) for correct conversion of their total into £s
or
M1 for repeated addition (condone 23 or 25) must be an
attempt to add
A1 for 9000
A1 (dep on M1) for correct conversion of their total into £s

(b)
$$20)\overline{135.5^{15}0^{10}0}$$ with 6.75 above
     3

= 6.75

M1 for 135 ÷ 20 with 6 units identified

M1 for a correct method to deal with remainder

A1 cao

or

M1 for complete method for division broken up correctly

M1 for a correct method to deal with remainders

A1 cao

                                                           [6]

07.   (a)   12   1

B1 accept $2^2 \times 3$ oe

(b) $96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$ 2

      $2^5 \times 3$

*M1 for attempting to split 96 into a product of at least
2 correct factors
or listing at least 3 correct factors
or a factor tree with at least 2 correct factors*

*or 2^5 with 3
or 2, 2, 2, 2, 2, 3*

A1 for $2^5 \times 3$ or $2 \times 2 \times 2 \times 2 \times 2 \times 3$ oe

                                                            [3]

08.   6549 – 5137 (= 1412)   4

"1412" × 52 (= 73424)

"73424" ÷ 100

= 734.24

M1 for 6549 – 5137 or 1412 seen

M1 (dep) for "1412" × 52 or 73424 seen

*M1 for "73424" ÷ 100 (this depends upon "73424" being
the result of a direct product of 52 and units given in the
question)*

A1 cao

Alternative

6549 × 52 (= 340548)

5137 × 52 (= 267124)

"340548" ÷ 100 – "267124" ÷ 100

Alternative

M1 for 6549 × 52 or 340548 seen or 5137 × 52 or 267124 seen

M1 for "340548" ÷ 100 or "267124" ÷ 100 (this depends upon "340548" or "267124" being the result of a direct product of 52 and units given in the question)

M1 (dep on 1st M1) for "340548" – "267124"
or "340548 ÷ 100" – "267124 ÷ 100"
A1 cao

As we have all seen, the concept of bills involving meter readings is totally foreign to many candidates. Very many are finding the sum of the units and then finding the cost of the total.
The new alternative method goes some way to address this issue.
Essentially the 3 method marks can be classified as follows:

*M1 for multiplying by 52; **either,** the number of either of the units given, or the **difference** of the units given or the **sum** of the units given. No other product gains this mark.*

M1 for a correct method to convert any of the answers derived from the method above into pounds. Often this is seen combined with the method above by a product including 0.52 This method mark is dependent upon the award of the previous M1.

M1 for working out the difference between the reading/cost from "new" to "old"

Candidates following the sum of the two readings/costs can only get a maximum of 2 marks (the first 2 method marks)
Sight of the digits 607672 with or without working, gets M1
Sight of 6076.72 with or without working, gets M2 (I know that these imply a multi-stage operation, but the numbers couldn't have come from anywhere else)

Similarly, sight of just 1412 or 340548 or 267124 gets 1 mark
sight of just 73424 or 3405.48 or 2671.24 gets 2 marks
(Note: sight of just 14.12 gets M1 only)
sight of 734.24 gets the full 4 marks unless contradicted by another answer on the answer line.

[4]

09.   2*n*   *n* + 1
         ⊠   ⊠   2

                B1 for each correct answer
                (–1 for each extra)

[2]

01.   This question proved to be a good discriminator. In part (a) those candidates who worked out that 4 CD holders cost £1 often went on to score full marks, the exception being those who lost the accuracy mark for an error in multiplying the 4 & 15. Others attempting to divide by 25 had more difficulty. In part (b) many candidates were able to find 1*0%,* 5% of £50 correctly, but many then went on to present either an incorrect or incomplete method, perhaps even just finding 1% and *Vi%,* and not the required *2Vi%,* which seems strange. Those who tried to work out 50 × 17.5 ÷ 100 often made errors in calculation. A significant number failed to attempt to add their VAT back onto the £50. The weakest candidates merely added 17.5 onto 50.

02.   Many candidates obtained the two marks available by correctly multiplying 2 by another prime number. 2 × 2 and 2 × 3 were seen often. Errors arose when candidates did not use 2 as one of their prime numbers. Some used numbers that were prime but too large for them to multiply correctly. Some used 1 as a prime number.

03.   For the better candidate parts (a) and (b) were well answered. It was very rare to get success with this question for candidates who were aiming for Grade F and E. Part (c) was hardly ever correct on this foundation paper.

04.   Whilst many candidates realised the need to multiply 900 by 1.70 in part (a) and went on to give the correct answer, a significant number incorrectly placed the decimal point in their answer. They were awarded one out of the two marks available for this part of the question.

Part (b) was answered much less successfully than part (a), though a good proportion of candidates identified the correct operation. Despite the instruction to "give your answer to the nearest penny", many candidates recorded 94.1, 94 or 90 on the answer line without working and so lost marks unnecessarily.

This question demonstrated the disadvantage of candidates not having a calculator available to them.

05.   Candidates found this question quite difficult. Common wrong answers for part (a) were 8 for part (i), 32 for (ii) and 6 cubed for (iii). There was more success with part (b) with about half the candidates gaining both the correct answers.

06.   It was very rare to see fully correct answers to this question as candidates do struggle with long multiplication and long division. They achieved more success in the multiplying rather than the dividing with counting on methods gaining some success in part (a) and dividing by 10 then 2 gaining success in (b).

07.   It was disappointing to note that the mean mark for this 3 mark question was only 0.49 This mark was generally scored for an attempt to express 96 as a product of its prime factors, either by getting some correct factors in a factor tree or listing some factors or expressing 96 as a product of two numbers. Many just listed the prime numbers smaller than 96 whilst others then went on to reach 96 by using a combination of these prime numbers e.g. $3 \times 19 + 23 + 11 + 5$ or $(7 \times 5) + 19 + 17 + 11 + 7$.

08. Many candidates clearly did not understand the concept of meter readings and utility bill calculations. Multiplying the sum of the two meter readings by 52 was a common error. This was often left as an answer of £607672 and sometimes £6076.72, gaining one and two marks respectively. Candidates readily accepting a gas bill of such magnitude.

Weaker candidates chose to divide the sum, or sometimes the difference, of the readings by 52 Even when the difference (1412) was multiplied by 52 an answer of £73424 often seen.

09. Many candidates gained at least one mark here for selecting at least one correct expression from the four alternative answers.