M1.

(a) A and D

B1

(b) No and a number cannot be both odd and even
or
No and a number cannot be both square and prime
or
No and a number cannot be two-digit, even and prime

oe

Accept eg

No and a number cannot be both A and B

B1

(c) 16 or 36 or 64 and A, D, E
or
25 or 49 or 81 and B, D, E
or
11 or 13 or 17 or 19 or 23 or 29 or
31 or 37 or 41 or 43 or 47 or 53 or
59 or 61 or 67 or 71 or 73 or 79 or
83 or 89 or 97 and B, C, E

B1 Any of the correct possible numbers (listed for B2) but with incorrect properties

or

any even square number and A, D

or

any odd square number and B, D

or

any prime number > 2 and B, C

or

2 and A, C

B2

[4]

M2.

26

B1

[1]

M3.

4

B1

[1]

M4.

No and shows an example of an even multiple of 3 + a multiple of 2 = an even number

eg No and 6 + 4 = 10

B1

[1]

M5.

x = 81 and y = 19

B1 100 – (a square number) correctly evaluated

or 100 – (a prime number) correctly evaluated

or A list of square numbers up to and including 81 with one error or omission and a list of prime numbers up to and including 19 with one error or omission

or A correctly evaluated trial of a square number plus a prime number.

e.g. 49 + 53 = 102

B2

Additional Guidance

Condone x = 19 and y = 81

B2

x = 9^2 and y = 19

B2

x = 9 and y = 19 with $9^2 = 81$ or $9^2 + 19$ or 81 + 19 in working

B2

x = 9 and y = 19 without working

B1

49 and 51 implies 100 – (a square number) correctly evaluated

B1

91 and 9 implies 100 – (a square number) correctly evaluated

B1

[2]

M6.

(a) 2 (×) 100 or 5 (×) 40

oe conditional on one prime factor in a correct product equal to 200 or one prime factor shown in a correct section on a factor tree starting from 200

Any order

allow on prime factor tree or repeated division using 2 or 5 correctly

condone 100 (×) 2 (×) 1 etc for this mark

M1

2 (×) 2 (×) 2 (×) 5 (×) 5

Any order

allow on prime factor tree or repeated division

A1

$2^3 \times 5^2$

Strand (i) correct index notation

Any order

ft correct product of prime numbers in index form from their working

Q1ft

Additional Guidance

$2^3 + 5^2$

M1A1Q0

(200 =) 2 (×) 2 (×) 5 (×) 5 and $2^2 \times 5^2$ is minimum Q1ft

200 ÷ 2 = 100

M1

2 (×) 10 (×) 10 as a product or shown on a correct section of factor tree

M1

20 (×) 5 (×) 2 as a product or shown on a correct section of factor tree

M1

20 (×) 5 (×) 4 as a product or shown on a correct section of factor tree

M0

(b) 4 and 60 **and** 12 and 20

B1 one correct
or one correct and one incorrect
or two correct and one incorrect
Any indication

B2

[5]

M7.

(a) 2 (×) 66 or 3 (×) 44 or 2 (×) 6 (×) 11

or 3 (×) 4 (×) 11 or 12 (×) 11

or 2 (×) 2 (×) 33 or 2 (×) 3 (×) 22

Any order
Allow on prime factor tree or repeated division.
Condone 2 (×) 66 (×) 1 etc

M1

$2 \times 2 \times 3 \times 11$

or $2^2 \times 3 \times 11$

Any order

A1

Additional Guidance
2, 2, 3, 11

M1A0

(b) **Alternative method 1**
2 (×) 5 (×) 11 = 110

M1

22

SC1 11

A1

Alternative method 2
List of factors of 110 **and** 132 up to 22 with 2 errors or omissions

(1), 2, 5, 10, 11, 22 (55, 110)
and

(1), 2, 3, 4, 6, 11, 12, 22
(33, 44, 66, 132)

M1

22

SC1 11

A1

Additional Guidance
(1, 55, 110) and (1, 33, 44, 66, 132) are not omissions

[4]

M8.

(a) Substitutes and evaluates correctly to show that the answer is even

e.g.
$5^2 + 3^2 = 34$ *or* $3^2 + 5^2 = 34$
$25 + 9 = 34$ *or* $9 + 25 = 34$
$7^2 + 3^2 = 58$ *or* $3^2 + 7^2 = 58$
$49 + 9 = 58$ *or* $9 + 49 = 58$
$7^2 + 5^2 = 74$ *or* $5^2 + 7^2 = 74$
$49 + 25 = 74$ *or* $25 + 49 = 74$
Ignore fw

B1

Additional Guidance
One correct example required with or without incorrect examples
e.g. $2^2 + 3^2 = 13$, $5^2 + 3^2 = 34$

B1

(b) Substitutes and evaluates correctly to show that the answer is odd

e.g.
$3^2 + 2^2 = 13$ *or* $2^2 + 3^2 = 13$
$9 + 4 = 13$ *or* $4 + 9 = 13$
$5^2 + 2^2 = 29$ *or* $2^2 + 5^2 = 29$
$25 + 4 = 29$ *or* $4 + 25 = 29$
$7^2 + 2^2 = 53$ *or* $2^2 + 7^2 = 53$
$49 + 4 = 53$ *or* $4 + 49 = 53$
Ignore fw

B1

Additional Guidance
One correct example required with or without incorrect examples
e.g. $2^2 + 3^2 = 13$, $5^2 + 3^2 = 34$

B1

[2]

M9.(a) 120, 150 and 180 with none incorrect

any order

B1 Two correct multiples in range with at most one incorrect
or all three correct with any other multiples of 30
or another group of exactly three multiples of 30

B2

(b) 8

B1

[3]

M10.(a) 36

B1

(b) Yes and 3 × 40 and 4 × 30

Yes and 12 × 10 or

Yes and in 12 times table or

Yes and 3 and 4 are factors of 120 or

Yes and both lists correctly written out up to 120 or

No because 20 is missing

oe

eg *it divides by 12*
it's in both times tables
3 and 4 go into 120

B1

[2]

M11.

4961

B2 2561 3661 6461 8161
3601 3602 4901 4902
6401 6402 8102
6149

B1 Any other 4 digit number beginning
36.. 49.. 64.. 81..
or any other number ending 61
or a list of at least three 2-digit square numbers
or 61 seen as a factor of 122

B3

[3]

M12.

(a) Correct set of four different prime numbers

B1

all numbers prime and the calculation correct, but with repeated numbers used

or

all numbers different and three of the four numbers prime and the calculation correct

or

at least four prime numbers identified with no incorrect numbers

or

at least five prime numbers identified with one incorrect number

B2

(b) 2 is the only even prime number, so the sum must be even

oe Strand (ii)

Q1

2 is the only even prime number

or

(with 2 in) the sum would be even

or

even + odd + odd = even

or

2 can't be the answer (as it's the smallest prime number)

or

one or more correct numerical example(s) using 2, with no incorrect examples

Q2

[4]

M13.

Odd ticked

B1

Odd × odd = odd or a^2 = odd

Even × even = even or b^2 = even

Odd plus even = odd

Strand (ii). Clear explanation.

This is not dependent on the correct box being ticked.

Q1

[2]

M14.

(a) 2 × 25 or 5 × 10

oe eg 50 ÷ 2 = 25 ***or*** *branches on a prime factor tree* ***or*** *any indication eg (2, 25) of a 'product' that equals 50* ***or*** *2, 5, 5* ***or*** *2, 5 and 5 shown as the last numbers of a prime factor tree (allow 1s)*

M1

2 × 5 × 5

$2^{(1)} \times 5^2$

A1

(b) List of multiples of 40 and 50 to at least 80, 120 and 100, 150

Venn diagram (ft their prime factors for 50 in (a))

M1

$2^3 \times 5^2$ or 200

oe SC1 any multiple of 200

A1

[4]

M15.

4 packs of bread rolls and
25 packs of sausages

B2 4n packs of bread rolls and
25n packs of sausages
where n is an integer > 2
e.g. 8 packs of bread rolls and
50 packs of sausages

B1 Works out a common multiple of 8 and 25
e.g.1 8, 80,160, 200 and
25, 50, 100, 200, 250
e.g.2 $8 \times 25 = 200$
e.g.3 $2^3 \times 5^2 = 200$

or

Indicates a valid number of bread rolls and sausages
i.e. 100m bread rolls and
200m sausages
where m is an integer > 0

SC2 25 packs of bread rolls and
4 packs of sausages

B3

[3]

M16.(a) 35

any clear indication

B1

(b) 12

any clear indication

B1

(c) 48

any clear indication

B1

[3]

M17.(a) 27

B1

(b) 20

B1

(c) 16

B1

(d) 13

B1

[4]

M18.(a) 6

B1

(b) Subtract 5

oe

Accept –5n + 36

B1

Additional Guidance

number – 5

B1

n – 5

B1

Going down in 5s

B1

Take 5

B1

The first number – 5

B0

n = –5

B0

–5*n*

B0

(c) –4

B1

Additional Guidance

negative 4

B1

minus 4

B1

(d) True

False

False

B1 each

B3

[6]