St Andrew's Academy

Mathematics Department
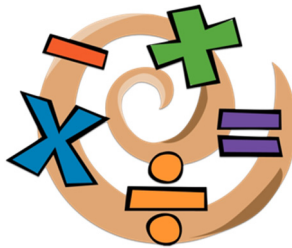
S1 BLOCK 3

Number

Multiples, Factors & Primes
BODMAS

Corbett
mαths

Workout

Question 1:   Write down the first six multiples of these numbers

(a) 5   (b) 3   (c) 4   (d) 10   (e) 7   (f) 9

(g) 11   (h) 20   (i) 100   (j) 50   (k) 12   (l) 35

Question 2:   Below is a list of numbers.

    12   15   17   20   22   25   27   30   32   35   39   40

    From the list write down any numbers that are multiples of:

(a) 2   (b) 5   (c) 10   (d) 3   (e) 4   (f) 8

Question 3:   List all the numbers between 40 and 60 (inclusive) that are multiples of:

(a) 5   (b) 3   (c) 6   (d) 8   (e) 9   (f) 14

Question 4:   Below is a list of numbers.

    100   101   102   103   104   105   106   107   108   109

    From the list write down any numbers that are multiples of:

(a) 2   (b) 3   (c) 5   (d) 10   (e) 4   (f) 15

Question 5:   (a) List the first ten multiples of 3.
               (b) List the first ten multiples of 4.
               (c) Write down any numbers listed that are multiples of both 3 and 4.

Question 6:   (a) List the first ten multiples of 5.
               (b) List the first ten multiples of 6.
               (c) Write down any numbers listed that are multiples of both 5 and 6.

Question 7:   (a) List the first ten multiples of 6.
               (b) List the first ten multiples of 9.
               (c) Write down any numbers listed that are multiples of both 6 and 9.

Question 8: Write down three common multiples of 8 and 12.

Question 9: Write down three common multiples of 4 and 6.

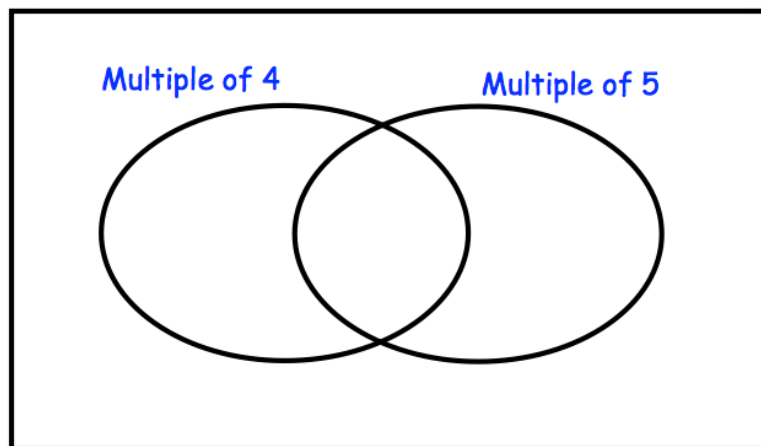**Question 10:** Write down three common multiples of 15 and 20.

Apply

Question 1: A light flashes every 8 seconds. How many times will it flash in 3 minutes?

Question 2: Find the smallest number over 200 that is a multiple of 6.

Question 3: Copy the Venn diagram below.
Place these numbers into the Venn diagram: 8, 10, 12, 13, 20, 22, 25, 40, 50

Multiple of 4   Multiple of 5

Question 4: Find the first even number that is a multiple of 5 and 7.

Question 5: A crate can hold 12 cans of lemonade.
Thomas has 200 cans of lemonade.
How many crates can be filled?

Question 6: Find a number that is a multiple of 2, 3, 4, 5 and 6.

Corbett maths

Workout

Question 1:   (a) Write down the first ten multiples of 2.
(b) Write down the first ten multiples of 3.
(c) List the first three common multiples of 2 and 3.

Question 2:   (a) Write down the first ten multiples of 4.
(b) Write down the first ten multiples of 5.
(c) List the first three common multiples of 4 and 5.

Question 3:   Write down three common multiples of each of these pairs of numbers.

(a) 2 and 5   (b) 3 and 4   (c) 4 and 6   (d) 10 and 15

(e) 20 and 30   (f) 3 and 5   (g) 6 and 9   (h) 6 and 12

Question 4:   (a) Write down the first ten multiples of 5.
(b) Write down the first ten multiples of 8.
(c) Find the lowest common multiple (LCM) of 5 and 8.

Question 5:   (a) Write down the first ten multiples of 6.
(b) Write down the first ten multiples of 8.
(c) Find the lowest common multiple (LCM) of 6 and 8.

Question 6:   Find the lowest common multiple (LCM) of each of these pairs of numbers.

(a) 5 and 6   (b) 2 and 7   (c) 3 and 8   (d) 4 and 10

(e) 9 and 4   (f) 6 and 7   (g) 6 and 8   (h) 9 and 12

(i) 15 and 40   (j) 12 and 20   (k) 13 and 4   (l) 18 and 6

(m) 25 and 35   (n) 22 and 33   (o) 16 and 24   (p) 20 and 28

Question 7:   Find the lowest common multiple (LCM) of each of these sets of numbers.

(a) 2, 3 and 5   (b) 3, 4 and 5   (c) 2, 5 and 7   (d) 5, 6 and 9

(e) 10, 12 and 15   (f) 2, 3, 4 and 5   (g) 1, 2, 3, 4, 5 and 6.

Corbett maths

Apply

Question 1:   A toad croaks every 8 seconds.
A frog croaks every 6 seconds.
They both croak at the same time.
After how many seconds will they next both croak at the same time?

Question 2:   A bus leaves Antrim Bus Station every 12 minutes.
A train leaves Antrim Train Station every 18 minutes.
At 8am a bus and a train leave the stations at the same time.

(a) When is the next time that a bus and a train leave at the same time?
(b) Between 8am and 11am, on how many occasions does a bus and a train
leave at the same time?

Question 3:   The lowest common multiple of two numbers is 60.
Only one of the numbers is a multiple of 4.
Write down two possible numbers.

Question 4:   The lowest common multiple of two numbers is 70.
Both numbers are less than 20.
Write down two possible numbers.

Question 5:   A red light flashes every 6 seconds.
A green light flashes every 15 seconds.
A blue light flashes every 21 seconds.
They have all flashed at the same time.
After how many seconds will they next all flash at the same time?

Question 6:   Explain why Charlie is wrong

To find the LCM of two numbers,
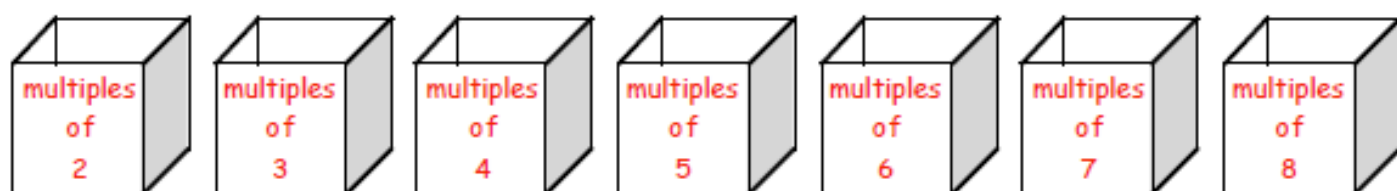just multiply them together

Question 7:   Penny and Kenny have the same number of football cards.
Penny has sorted her cards into piles of 10.
Kenny has sorted his cards into piles of 18.
Penny has less than 100 cards.
How many football cards do they have?

Question 8:   Jennifer says that the lowest common multiple of two consecutive numbers
is equal to the product of the two numbers.

By trying four different pairs of consecutive numbers, explore her theory.

Multiples

1. Write down the first six multiples of 4, starting with 4, 8, ...

2. Write down the first six multiples of 7, starting with 7, 14, ...

3. Write down the first ten multiples of 8 starting with 8

4. Say which of the following statements are **true** and which are **false** :-

    a   28 is a multiple of 7

    b   35 is a multiple of 6

    c   42 is a multiple of 6

    d   90 is a multiple of 5

    e   72 is a multiple of 8

    f   54 is a multiple of 7

    g   121 is a multiple of 11

    h   600 is a multiple of 20

5. From the following list of numbers, say which boxes each number could be placed in.
    (*Some numbers can go in more than one box*)

    12, 14, 16, 18, 20, 24, 28, 30, 32, 33, 35, 36, 38, 40, 42, 44, 45, 48, 49, 50, 52, 54.

multiples of 2	multiples of 3	multiples of 4	multiples of 5	multiples of 6	multiples of 7	multiples of 8

6. Make a list of :-

    a   the multiples of 3 between 20 and 40

    b   the multiples of 5 between 12 and 52

    c   the multiples of 4 between 15 and 35

    d   the multiples of 7 between 10 and 50

7. a   Write down the first ten (non-zero) multiples of 4.   {4, 8, ...   }

    b   Write down the first ten (non-zero) multiples of 6.   {6, 12, ...   }

    c   Write down all the numbers which appear in both lists (multiples of 4 and of 6).

    d   These are called the "common multiples" of 4 and 6.
        What is the smallest (the lowest) multiple they have in common ?

        This is called the **lowest common multiple** of 4 and 6, (or the **l.c.m.** of 4 and 6).

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8. **a** Write down the first ten multiples of 2.

    b Write down the first ten multiples of 3.

    c Write down all the numbers which appear in both lists (multiples of 2 and of 3).

    d What is the **lowest common multiple** of 2 and 3, (or the **l.c.m.** of 2 and 3).

9. By writing down the multiples of 6 and 8, find the **l.c.m.** of 6 and 8.

10. Find the l.c.m. of the following pairs of numbers :-

    a 4 and 5   **b** 6 and 9   **c** 2 and 5

    d 8 and 10   **e** 5 and 6   **f** 3 and 5

    g 6 and 10   **h** 10 and 12   **i** 5 and 10.

11. Find the l.c.m. of the following sets of numbers

    a 2, 3 and 4   **b** 3, 4 and 5   **c** 3, 4 and 6

    d 4, 6 and 8   **e** 2, 5 and 6   **f** 5, 6 and 7

12. At a disco, the red light flashes every 4 seconds, the blue light flashes every 5 seconds and the yellow light flashes every 6 seconds.

    At a certain moment in time, all 3 lights flash at the same time.

    a How many seconds pass before they all flash together again ?

    b When is the next time after that they flash together again ?

Multiples

Q1 - Multiples and divisibility

Look at these numbers:

$$35, \ 57, \ 88, \ 160, \ 174, \ 444, \ 460, \ 890$$

Choose a number from the list that is:

a multiple of 3	☐	[1]	divisible by 5	☐
divisible by 2	☐	[1]	a multiple of 6	☐
a multiple of 10	☐	[1]	a multiple of 7	☐
divisible by 4	☐	[1]	divisible by 8	☐

Q2 - Common multiples and LCM

Look at these numbers: 27, 40, 75, 24, 44, 68

Choose a number from
the list that is:

a multiple of 3 but not a multiple of 4	☐
a multiple of 4 and a multiple of 5	☐
a common multiple of 3 and 5	☐

Find the lowest common multiple of:		
	4 and 22	☐
	8 and 18	☐
	2 and 3 and 10	☐

7

Workout

Question 1:   List all the factors of these numbers

(a) 8   (b) 10   (c) 7   (d) 12   (e) 20   (f) 22   (g) 18

(h) 50   (i) 15   (j) 19   (k) 30   (l) 100   (m) 32   (n) 24

(o) 42   (p) 28   (q) 66   (r) 70   (s) 45   (t) 60   (u) 25

Question 2:   Is 3 a factor of.... ?

(a) 14   (b) 21   (c) 27   (d) 32   (e) 57   (f) 301   (g) 100

Question 3:   Is 5 a factor of.... ?

(a) 20   (b) 34   (c) 40   (d) 38   (e) 45   (f) 102   (g) 135

Question 4:   List all the factors of these numbers (you may use a calculator)

(a) 84   (b) 140   (c) 200   (d) 240   (e) 145   (f) 192   (g) 244

Question 5:   Is 9 a factor of.... ?

(a) 38   (b) 90   (c) 72   (d) 108   (e) 909   (f) 9001   (g) 293

Apply

Question 1:   21   25   30   45
              Which number is the odd one out? why?

Question 2:   15   24   28   33
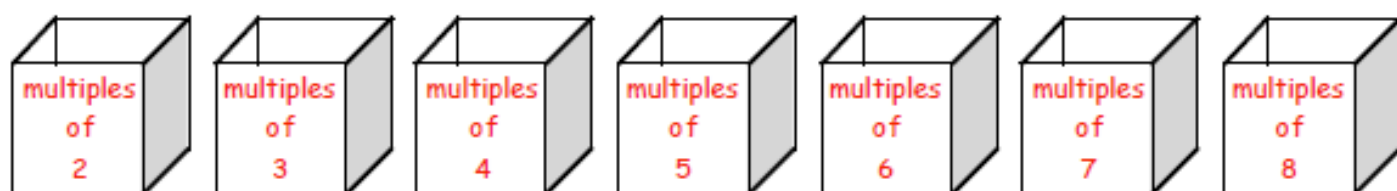   Which number is the odd one out? why?

Question 3:

Mary has 26 sweets and is able to share them evenly between her friends.
Mary has more than 1 friend.
Write down how many friends Mary might have.

Question 4:   James says that all numbers have an even number of factors.
              Is he correct?

Multiples

1. Write down the first six multiples of 4, starting with 4, 8, ...

2. Write down the first six multiples of 7, starting with 7, 14, ...

3. Write down the first ten multiples of 8 starting with 8

4. Say which of the following statements are **true** and which are **false** :-

   a 28 is a multiple of 7   b 35 is a multiple of 6

   c 42 is a multiple of 6   d 90 is a multiple of 5

   e 72 is a multiple of 8   f 54 is a multiple of 7

   g 121 is a multiple of 11   h 600 is a multiple of 20

5. From the following list of numbers, say which boxes each number could be placed in.
   (*Some numbers can go in more than one box*)

   12, 14, 16, 18, 20, 24, 28, 30, 32, 33, 35, 36, 38, 40, 42, 44, 45, 48, 49, 50, 52, 54.

multiples of 2	multiples of 3	multiples of 4	multiples of 5	multiples of 6	multiples of 7	multiples of 8

6. Make a list of :-

   a the multiples of 3 between 20 and 40   b the multiples of 5 between 12 and 52

   c the multiples of 4 between 15 and 35   d the multiples of 7 between 10 and 50

7. a Write down the first ten (non-zero) multiples of 4.   {4, 8, ...   }

   b Write down the first ten (non-zero) multiples of 6.   {6, 12, ...   }

   c Write down all the numbers which appear in both lists (multiples of 4 and of 6).

   d These are called the "common multiples" of 4 and 6.
      What is the smallest (the lowest) multiple they have in common ?

      This is called the **lowest common multiple** of 4 and 6, (or the **l.c.m.** of 4 and 6).

8. **a** Write down the first ten multiples of 2.

   b Write down the first ten multiples of 3.

   c Write down all the numbers which appear in both lists (multiples of 2 and of 3).

   d What is the **lowest common multiple** of 2 and 3, (or the **l.c.m.** of 2 and 3).

9. By writing down the multiples of 6 and 8, find the l.c.m. of 6 and 8.

10. Find the l.c.m. of the following pairs of numbers :-

   a 4 and 5   **b** 6 and 9   **c** 2 and 5

   d 8 and 10   **e** 5 and 6   **f** 3 and 5

   g 6 and 10   **h** 10 and 12   **i** 5 and 10.

11. Find the l.c.m. of the following sets of numbers

   a 2, 3 and 4   **b** 3, 4 and 5   **c** 3, 4 and 6

   d 4, 6 and 8   **e** 2, 5 and 6   **f** 5, 6 and 7

12. At a disco, the red light flashes every 4 seconds, the blue light flashes every 5 seconds and the yellow light flashes every 6 seconds.

   At a certain moment in time, all 3 lights flash at the same time.

   a How many seconds pass before they all flash together again ?

   b When is the next time after that they flash together again ?

10

Q1 – Factors and primes

List all the factors of these numbers.

Number	Factors
6	☐ ☐ ☐ ☐
16	☐ ☐ ☐ ☐ ☐
20	☐ ☐ ☐ ☐ ☐ ☐
24	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Write down all the prime factors of 6.   ☐ ☐

Q2 – Common factors and HCF

The factors of 55 are 1, 5, 11 and 55.

The factors of 185 are 1, 5, 37 and 185.

Write down:

all the common
factors of 55 and 185   ☐ , ☐

the highest common
factor of 55 and 185   ☐

Find the highest common factor of
these number pairs:

64 and 40   ☐

20 and 30   ☐

11

Workout

Question 1:   (a) List all the factors of 10
              (b) List all the factors of 15
              (c) Write down all the common factors of 10 and 15.

Question 2:   (a) List all the factors of 12
              (b) List all the factors of 18
              (c) Write down all the common factors of 12 and 18.

Question 3:   Write down all the common factors of each of these pairs of numbers.

(a) 6 and 8   (b) 15 and 20   (c) 9 and 15   (d) 7 and 14

(e) 30 and 40   (f) 21 and 27   (g) 18 and 30   (h) 16 and 24

Question 4:   (a) List all the factors of 14
              (b) List all the factors of 21
              (c) Find the highest common factor (HCF) of 14 and 21.

Question 5:   (a) List all the factors of 24
              (b) List all the factors of 36
              (c) Find the highest common factor (HCF) of 24 and 36.

Question 6:   Find the highest common factor (HCF) of each of these pairs of numbers.

(a) 4 and 14   (b) 6 and 9   (c) 9 and 21   (d) 8 and 12

(e) 6 and 15   (f) 10 and 17   (g) 30 and 45   (h) 40 and 60

(i) 28 and 63   (j) 24 and 36   (k) 16 and 28   (l) 18 and 45

(m) 150 and 200   (n) 12 and 54   (o) 90 and 270   (p) 39 and 65

Question 7:   Find the highest common factor (HCF) of each of these sets of numbers.

(a) 12, 6 and 15   (b) 27, 33 and 12   (c) 30, 15 and 25   (d) 8, 20 and 12

(e) 10, 25 and 13   (f) 12, 24 and 30   (g) 9, 36 and 45   (h) 100, 125 and 200

Apply

Question 1:   Martin says that 6 is a common factor of 42, 36 and 50.
Is he correct?

Question 2:   Alannah has two lengths of ribbon.
One length of ribbon is 36cm long and the other length is 45cm long.
Alannah wants to cut lengths of ribbon into shorter lengths that are of equal length.
Alannah does not want any ribbon left over.
What is the longest possible length for each of the shorter lengths of ribbon?

Question 3:   Sam has completed his maths homework.
Can you spot any mistakes?

Find the highest common factor of 18 and 36

Factors of 18:   2, 3, 6, 9
Factors of 36:   2, 3, 4, 6, 9, 12, 18

HCF = 9

Question 4:   Olivia thinks of two numbers.
The lowest common multiple (LCM) of the two numbers is 36.
The highest common factor (HCF) of the two numbers is 3.
Both numbers are less than 15.
Write down two possible numbers that Olivia could be thinking of.

Question 5:   Niamh thinks of two numbers.
The highest common factor (HCF) of the two numbers is 8.
The lowest common multiple (LCM) of the two numbers is a multiple of 5.
Write down two possible numbers that Niamh could be thinking of.

Question 6:   Emily thinks of two numbers.
The highest common factor (HCF) of the two numbers is 1.
The lowest common multiple (LCM) of the two numbers is a multiple of 40.
Write down two possible numbers that Emily could be thinking of.

Examples

Click here   Scan here

Workout

Question 1:   Find the lowest common multiple (LCM) of each pair of numbers.

(a) 15 and 35   (b) 14 and 22   (c) 15 and 21   (d) 9 and 33

(e) 12 and 15   (f) 18 and 30   (g) 16 and 20   (h) 24 and 30

(i) 16 and 36   (j) 26 and 39   (k) 25 and 30   (l) 16 and 18

(m) 24 and 56   (n) 36 and 45   (o) 60 and 72   (p) 42 and 90

Question 2:   Find the highest common factor (HCF) of each pair of numbers

(a) 21 and 49   (b) 35 and 45   (c) 18 and 24   (d) 18 and 45

(e) 30 and 75   (f) 28 and 42   (g) 60 and 90   (h) 48 and 64

(i) 56 and 72   (j) 18 and 23   (k) 84 and 96   (l) 38 and 95

(m) 66 and 121   (n) 56 and 140   (o) 180 and 225   (p) 64 and 224

Apply

Question 1:   Given $60 = 2^2 \times 3 \times 5$ and $84 = 2^2 \times 3 \times 7$

Find (a) the lowest common multiple (LCM)

and (b) the highest common factor (HCF)

Question 2:   Find the lowest common multiple (LCM) of 15, 20 and 25.

Question 3:   A red light flashes every 28 seconds.
A green light flashes every 24 seconds.
They both flash at the same time.
After how many seconds will they next both flash at the same time?

Question 4:   A bus heading to Belfast leaves Antrim every 36 minutes.
A bus heading to Ballymena leaves Antrim every 45 minutes
At 10am bus to Belfast and a bus to Ballymena both leave Antrim Bus Station.
Work out the next time that both buses leave at the same time.

Question 5:   Find the lowest common multiple of 124 and 200.

Question 6:   The LCM of two numbers is 130.
The HCF of the same two numbers is 13.
Both numbers are less than 100.
Write down two possible numbers.

Question 7:   Fred says that 20 and 21 have got a highest common factor of 0.
Explain why Fred is wrong.

Question 8:   Abby and Annie have the same number of coins.
Abby has sorted her coins into groups of 80.
Annie has sorted her coins into groups of 75.
They each have less than 2000 coins.
How many coins do they altogether?

Question 9:   Adam is working out the highest common factor of 100 and 112.
He has worked it out to be 22.
Can you explain what he has done wrong?

Answers
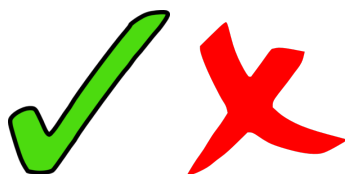
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Find the factors of:

Set1	Set 2	Set 3	Set 4	Set 5
Q1) 25	Q1) 13	Q1) 32	Q1) 31	Q1) 8
Q2) 27	Q2) 10	Q2) 28	Q2) 16	Q2) 29
Q3) 23	Q3) 7	Q3) 27	Q3) 22	Q3) 17
Q4) 11	Q4) 17	Q4) 24	Q4) 32	Q4) 16
Q5) 14	Q5) 30	Q5) 20	Q5) 23	Q5) 19
Q6) 24	Q6) 32	Q6) 12	Q6) 13	Q6) 9
Q7) 15	Q7) 20	Q7) 16	Q7) 28	Q7) 22
Q8) 17	Q8) 5	Q8) 34	Q8) 18	Q8) 28

Find the LCM and HCF

Set1	Set 2	Set 3	Set 4
Q1) 18 and 24	Q1) 27 and 12	Q1) 27 and 12	Q1) 30 and 18
Q2) 21 and 14	Q2) 25 and 15	Q2) 15 and 27	Q2) 30 and 10
Q3) 21 and 28	Q3) 22 and 12	Q3) 28 and 20	Q3) 27 and 15
Q4) 18 and 24	Q4) 10 and 22	Q4) 21 and 6	Q4) 24 and 9
Q5) 20 and 24	Q5) 9 and 12	Q5) 12 and 9	Q5) 26 and 8
Q6) 30 and 18	Q6) 22 and 4	Q6) 28 and 21	Q6) 2 and 30
Q7) 16 and 10	Q7) 10 and 26	Q7) 26 and 8	Q7) 16 and 10
Q8) 24 and 16	Q8) 14 and 21	Q8) 16 and 28	Q8) 30 and 25

16

The Sieve of Eratosthenes

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Step 1: 1 is not a prime number. Colour the box containing the number 1

Step 2: 2 is a prime number. Do NOT colour this box. Colour every following multiple of 2 (4, 6 ,8 etc)

Step 3: 3 is a prime number. Leave this box blank but colour every following multiple of 3 (6, 9, 12 etc)

Step 4: 5 is a prime number. Leave this box blank but colour every following multiple of 5 (10, 15, 20 etc)

Step 5: 7 is a prime number. Leave this box blank but colour every following multiple of 7 (14, 21, 28 etc)

Step 6: Complete the sentence below:

# The prime numbers between 1 and 100 are :

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Workout

Question 1:   List the first ten prime numbers

Question 2:   Are the numbers below, **prime** or **not prime**?

(a) 5   (b) 9   (c) 10   (d) 11   (e) 13   (f) 15

(g) 19   (h) 21   (i) 22   (j) 30   (k) 31   (l) 44

(m) 49   (n) 29   (o) 35   (p) 1   (q) 39   (r) 27

Question 3:   From the box, choose:

(a)   the smallest prime number
(b)   a prime number that is greater than 10
(c)   an even prime number
(d)   the largest prime number
(e)   three numbers that are not prime

7		19		2
	17		81	
9				99
	1	27		
101		100		55

Apply

Question 1:   Explain why Evie is wrong.
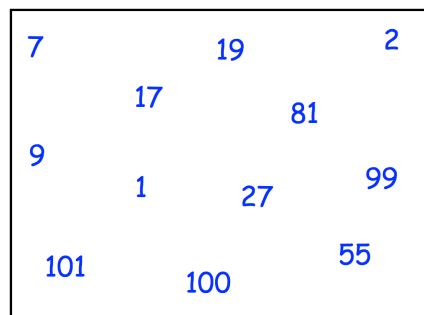
All prime numbers are odd

Question 2:   Use divisibility tests to see if any of these numbers are prime.

(a) 90   (b) 96   (c) 85   (d) 63   (e) 79   (f) 77

Question 3:   Find three different prime numbers that have a sum of 40.

Question 4:   Find three different prime numbers that have a product of 165

Question 5:   Goldbach's conjecture states

"every even number greater than 2 can be written as the sum of two primes."

Test this conjecture for all the even numbers up to 50.

Corbett maths

Examples

Workout

Click here   Scan here

Question 1: Write each of these numbers as the product of their prime factors.

(a) 10   (b) 12   (c) 20   (d) 18   (e) 16   (f) 30   (g) 100

(h) 26   (i) 24   (j) 27   (k) 42   (l) 33   (m) 38   (n) 64

Question 2: Write each of these numbers as the product of their prime factors.
Give your answers in index form.

(a) 36   (b) 40   (c) 28   (d) 48   (e) 80   (f) 200   (g) 75

(h) 32   (i) 105   (j) 81   (k) 52   (l) 242   (m) 108   (n) 500

Question 3: Some numbers have been written as products of their prime factors.
Work out each number.

(a) 2×7 (b) $2 \times 3 \times 5$ (c) $2 \times 5 \times 11$ (d) $2 \times 2 \times 2 \times 3$

(e) $2^2 \times 5$ (f) 3×5^2 (g) $2^3 \times 3^2$ (h) $3^2 \times 11$

(i) 5^4 (j) $2^4 \times 5^2$ (k) $3^3 \times 13$ (l) 7×17^2

Question 4: Write each of these numbers as the product of their prime factors.

(a) 9000   (b) 235   (c) 392   (d) 715   (e) 444   (f) 792   (g) 5625

Apply

Question 1: Using the fact that $12 = 2^2 \times 3$, write each of the following as the product of prime factors in index form.

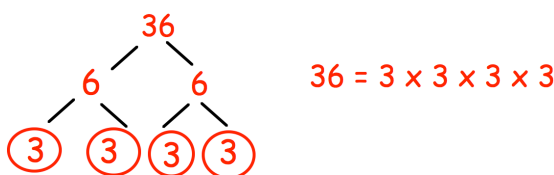(a) 24   (b) 36   (c) 60   (d) 48   (e) 120   (f) 84

Question 2: Using the fact that $300 = 2^2 \times 3 \times 5^2$, write each of the following as the product of prime factors in index form.
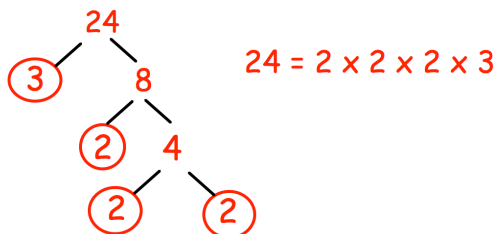
(a) 600   (b) 150   (c) 900   (d) 3300   (e) 1500   (f) 2400

Question 3: Ashley has completed his homework.
Can you spot any mistakes?

Express 36 as a product of its prime factors.

36 = 3 x 3 x 3 x 3

Write 24 as the product of its prime factors.
Give your answer in index form.

24 = 2 x 2 x 2 x 3

Question 4: (a) Write 980 as a product of prime factors.
Express your answer in index form.

(b) Find the lowest number by which 980 would need to be multiplied by to give a square number.

Question 5: (a) Write 480 as a product of prime factors.
Express your answer in index form.

(b) Find the lowest number by which 480 would need to be multiplied by to give a square number.

Question 6: (a) Write 2646 as a product of prime factors.
Express your answer in index form.

(b) Find the lowest number by which 2646 would need to be multiplied by to give a cube number.

Answers

Click here   Scan here

20

Find all of the prime factors of:

Set1	Set 2	Set 3	Set 4
Q1) 150	Q1) 1875	Q1) 490	Q1) 100
Q2) 1575	Q2) 200	Q2) 90	Q2) 45
Q3) 125	Q3) 100	Q3) 750	Q3) 126
Q4) 375	Q4) 225	Q4) 225	Q4) 525
Q5) 750	Q5) 54	Q5) 126	Q5) 18
Q6) 1250	Q6) 70	Q6) 189	Q6) 20
Q7) 60	Q7) 750	Q7) 420	Q7) 30
Q8) 45	Q8) 60	Q8) 1225	Q8) 150

Set 5	Set 6	Set 7	Set 8
Q1) 1125	Q1) 30	Q1) 45	Q1) 375
Q2) 225	Q2) 375	Q2) 270	Q2) 225
Q3) 210	Q3) 225	Q3) 120	Q3) 135
Q4) 450	Q4) 42	Q4) 125	Q4) 1125
Q5) 90	Q5) 300	Q5) 90	Q5) 245
Q6) 45	Q6) 1575	Q6) 60	Q6) 675
Q7) 30	Q7) 54	Q7) 225	Q7) 525
Q8) 60	Q8) 150	Q8) 315	Q8) 150

Workout

Question 1:   Work out

(a) 7 + 2 x 3   (b) 9 + 4 x 2   (c) 10 + 2 x 2   (d) 18 + 4 ÷ 2

(e) 20 – 5 x 2   (f) 8 – 2 x 3   (g) 21 – 9 ÷ 3   (h) 100 – 40 x 2

(i) 16 ÷ 1 – 3   (j) 5 + 5 x 5   (k) 13 – 7 ÷ 1   (l) 7 x 6 – 4

(m) 9 + 3 – 2   (n) 20 – 5 + 6   (o) 21 – 17 + 4   (p) 30 x 4 ÷ 2

(q) (7 + 7) ÷ 2   (r) 35 – (9 + 3)   (s) 40 x (2 + 3)   (t) 60 ÷ (1 + 5)

(u) 15 ÷ (3 + 2)   (v) 9 x (7 + 4)   (w) 90 ÷ (52 – 7)   (x) (8 + 9) x 3

(y) 10 + 5 + 3 x 3   (z) 100 – 6 + 2 x 3

Question 2:   Work out

(a) $5 – 2^2$ (b) $7 + 3^2$ (c) $9^2 + 1$ (d) $6^2 – 5^2$

(e) $(7 – 2)^2$ (f) $(4 + 3)^2$ (g) $(1 + 2)^3$ (h) $(2 + 8)^3$

(i) $10 – \sqrt{16}$ (j) $\sqrt{(2 + 14)}$ (k) $\sqrt{4} + 3^2$ (l) $2 x 5 – \sqrt{4}$

Question 3:   Work out

(a) 5 x 3 + 2 x 6   (b) 9 ÷ 3 + 15 x 2   (c) 10 ÷ 2 – 2 x 1   (d) 5 x (2 + 1) + 4

(e) 8 + (5 – 1) x 3   (f) 50 – (1 + 4) x 4   (g) $19 x 2 + 5^2$ (h) $8^2 + 2 x 3^2$

(i) $7 x (8 ÷ 4)^2$ (j) $11 + 11 – 6^2 ÷ 2$

Question 4:   Copy out the following and insert brackets in each to make the correct answer.

(a) 10 x 2 + 6 = 80   (b) 5 + 5 ÷ 5 = 2   (c) 18 – 6 ÷ 2 = 6

(d) 5 + 2 x 3 + 1 = 13   (e) 2 x 7 + 1 x 3 = 48   (f) $9 + 3^2 x 10 ÷ 2 = 90$

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Apply

Question 1:   Matthew says 9 + 3 x 2 = 15. Is he correct?

Question 2:   Samuel says 6 + 4 x 9 = 90. Is he correct?

Question 3:   Using the number 2, 3 and 4 and the operations +, –, and x make as many
              different possible answers.

Question 4:   Matilda thinks of a number, n.
              She adds 2 and then multiplies by 3.

              Which expression below is correct?

          A   B   C

      n + 2 x 3   3n + 2   (n + 2) x 3

Question 5:   Can you spot any mistakes?

          Work out   9 + 4 x 3 + 2

                    = 13 x 3 + 2

                    =   39 + 2

                    = 41

Extension Task

Using four number 2's try to make as many different answers as you can.
You may use +, –, x, ÷ and brackets.

You may use one or more of the 2's as powers.

BODMAS – Exercise 1

1 Write down the operation that you do first in each calculation, then work out the whole calculation.

    a $6 + 4 \times 2$ **b** $7 \times 2 - 4$ **c** $8 + 16 \div 2$ **d** $27 \div 3 - 5$

    e $8 \times 5 - 12$ **f** $4 + 5 \times 12$ **g** $54 \div 9 + 23$ **h** $24 - 16 \div 4$

2 Say whether the calculations and answers are true (T) or false (F):

    a $16 + 5 \times 3 = 31$ **b** $8 \times 5 - 3 = 16$

    c $9 + 15 \div 3 = 14$ **d** $33 + 3 - 2 = 33$

    e $5 \times 11 - 8 = 15$ **f** $14 + 5 \times 11 = 69$

    g $63 \div 9 + 13 = 20$ **h** $32 - 16 \div 2 = 8$

3 Work out these calculations

    a $3 \times 4 \times 5$ **b** $16 + 2 \times 2$ **c** $20 + 10 \div 2$ **d** $12 \times 6 \div 3$

    e $22 \times 2 - 11$ **f** $12 \div 4 + 3$ **g** $18 - 9 \times 2$ **h** $31 + 18 \div 6$

4 Calculate the following.

    a $3 \times (6 + 4)$ **b** $(4 + 8) \div 3$ **c** $15 + (4 + 1)$

    d $(12 + 2) \times 2$ **e** $(8 - 3) \times 5$ **f** $16 + (6 - 2)$

    g $20 \times (4 + 2)$ **h** $72 \div (2 + 7)$ **i** $(13 - 7) \times 8$

Calculate the following.

    a $(12 - 4) \times (6 + 3)$ **b** $(7 + 5) \times (3 + 1)$ **c** $(12 + 24) \div (13 - 10)$

5   **d** $(6 \times 4) + (8 - 3)$ **e** $(12 \times 3) - (5 \times 5)$ **f** $(5 \times 12) \div (36 \div 6)$

    g $(6 \times 6) \times (5 \times 2)$ **h** $(36 \times 1) \div (9 - 5)$ **i** $(48 - 18) - (10 - 4)$

BODMAS - Exercise 2

1 Work out the following showing each step of the calculation

a $2 \times 6 + 5$ b $2 \times (6 + 5)$ c $2 + 6 \times 5$

d $(2 + 6) \times 5$ e $3 \times 3 - 3$ f $7 \times 8 + 11$

g $12 \div 6 + 5$ h $24 \div (10 + 2)$ i $(4 + 3) \times (3 + 3)$

j $(10 + 8) \div (4 + 5)$ k $24 \div 4 \div 3$ l $3 \times 4 \times 5$

2 Put brackets into each of the following to make the calculation true.

a $3 \times 2 + 3 = 15$ b $3 + 4 \times 5 = 35$ c $3 + 1 \times 5 + 1 = 24$

d $4 + 5 \times 2 = 18$ e $4 + 3 \times 3 = 21$ f $4 \times 3 + 7 + 7 = 47$

g $24 \div 2 \times 3 + 7 = 11$ h $14 \div 9 - 2 + 13 = 15$ i $25 - 21 \times 4 + 3 = 28$

j $5 + 5 \times 5 + 5 = 10$ k $2 \times 2 \times 3 + 3 = 24$ l $45 + 5 \div 5 + 5 = 5$

3 One of the calculations below is wrong. Which is it and how could you add brackets to make it true?

a $3 \times 4 + 8 = 36$ b $3 \times 4 + 8 = 20$

4 By using brackets, find how many different answers you can get for these number sentences.

a $8 \times 6 + 4 + 7$ b $8 + 3 \times 9 - 2$

c $40 \div 4 \times 5 + 6$ d $100 \div 5 \times 5 \times 2$

5 Use brackets to make each answer an even number.

a $15 \times 4 \times 2 - 10$ b $4 \times 7 - 5 + 4$ c $72 - 40 \div 8$

d $3 + 6 \times 7 + 5$ e $7 + 6 \times 6 \div 3$ f $15 + 40 \div 5 + 3$

g $3 \times 5 + 3 \times 5$ h $48 - 13 \times 3 + 3$ i $48 \div 8 \times 2 + 9$

6 Use brackets to make each answer 100.

a $9 \times 4 + 8 \times 8$ b $50 - 25 \times 8 - 4$ c $9 + 11 \times 3 + 2$

d $4 + 32 \times 4 - 1$ e $36 + 14 \times 6 \div 3$ f $3 \times 25 + 5 + 10$

7 Use the digits 3, 4 and 5 to complete each of these calculations.

a $(\triangle \times \triangle) + \triangle = 17$ b $\triangle \times (\triangle + \triangle) = 27$

c $(\triangle + \triangle) \times \triangle = 32$ d $\triangle + (\triangle \times \triangle) = 23$

e $(\triangle + \triangle) \div \triangle = 3$ f $\triangle \times (\triangle \times \triangle) = 60$

g $(\triangle \times \triangle) - \triangle = 11$ h $\triangle + (\triangle \times \triangle) = 19$

8 Work out the value of each of these.

a $(6 + 6) \div (6 + 6)$ b $(6 \times 6) + (6 + 6)$ c $(6 + 6 + 6) \div 6$

d $6 \times (6 - 6) + 6$ e $(6 \times 6 + 6) \div 6$ f $(6 + 6 + 6) \div 2$

g $6 + 6 - 6 + 6$ h $(6 + 6) \times (6 \div 6)$ i $(6 + 6) \div 6 + 6$

9 Nicola orders 3 pairs of running socks from a running shop website. Each pair of socks costs £5·50 and there is a £4 charge for post and packing. To work out how much she pays, write the calculations you need to do and then find the answer.

10 Alastair buys 4 t-shirts from a running shop website. Each t-shirt costs £15. Alastair is a Gold customer and gets free delivery and £5·00 off the cost of the t-shirts. To work out how much he pays, write the calculations you need to do and then find the answer.

11 Karen buys 4 pairs of running socks (at £5·50 each) and 3 t-shirts (at £15 each). Karen is a Silver customer, so she gets free delivery, but she doesn't get any money off. To work out how much she pays, write the calculations you need to do and then find the answer.

12 The Chocolate Shop sells 1 kg blocks of chocolate for £8, and charges £2 to write a birthday message on the chocolate. What is the total cost for a $\frac{1}{2}$ kg block with a birthday message included? Write the calculations you need to do and then find the answer.

13 The Chocolate Shop sells 1 kg blocks of chocolate for £8. For a party, Sammy's mum buys a $\frac{1}{4}$ kg block of chocolate and 20 assorted chocolate animals. Each chocolate animal costs 60p. What is the total cost? Write the calculations you need to do and then find the answer.

Challenge

In Question 8, each calculation was made up of four 6s.

Work out the value of:

a $66 + 6 - 6$ b $6 \times 6 - 6 + 6$ c $6 \times 6 + 6 - 6$

Can you make other calculations using four 6s to give answers that you have not yet got in Question 8 or in the three calculations above? Do as many as you can see whether you can make all the values up to 20.

BODMAS (NO SQUARES)

Set1	Set 2	Set 3	Set 4

Calculate:

Set1
Q1) $(9 + 9) \div 2$

Q2) $7 + 18 \div 3$

Q3) $(2 + 5) \times 1$

Q4) $5 + 8 \times 6$

Q5) $(2 - 5) \times 1$

Q6) $3 - 4 \times 2$

Q7) $(8 - 16) \div 4$

Q8) $5 - 6 \div 3$

Set 2
Q1) $(6 + 2) \times 3$

Q2) $(8 + 7) \div 3$

Q3) $8 + 28 \div 7$

Q4) $3 + 6 \times 4$

Q5) $7 - 4 \times 8$

Q6) $(7 - 3) \times 8$

Q7) $(3 - 3) \div 5$

Q8) $4 - 56 \div 7$

Set 3
Q1) $7 + 3 \times 8$

Q2) $(6 + 8) \times 5$

Q3) $(12 + 12) \div 4$

Q4) $7 + 12 \div 6$

Q5) $(3 - 3) \div 2$

Q6) $9 - 6 \times 2$

Q7) $8 - 30 \div 6$

Q8) $(2 - 4) \times 3$

Set 4
Q1) $2 + 3 \times 5$

Q2) $(6 + 10) \div 2$

Q3) $(3 + 5) \times 6$

Q4) $5 + 18 \div 9$

Q5) $(3 - 8) \times 9$

Q6) $9 - 3 \times 7$

Q7) $6 - 8 \div 2$

Q8) $(2 - 6) \div 4$

BODMAS (ADD BRACKETS)

Set1

Add brackets to make true:
Q1) $3 + 2^2 \times 3 = 75$

Q2) $4 \times 3 \times 5 + 2 = 68$

Q3) $3 \times 3 \times 5 - 6 = -9$

Q4) $4 \times 5 - 4^2 = 4$

Q5) $8 + 3 \times 2^2 = 44$

Q6) $5 - 3 \times 6 - 6^2 = 5$

Set 2

Add brackets to make true:
Q1) $6 \times 2 \times 4 + 8 = 96$

Q2) $4 \times 6 - 9^2 = 36$

Q3) $4 + 3^2 \times 2 = 98$

Q4) $6 \times 4 \times 9 - 8 = 24$

Q5) $3 - 4 \times 5 - 3^2 = -13$

Q6) $5 - 2 \times 8 - 3 = -8$

Set 3

Add brackets to make true:
Q1) $2 \times 5 \times 6 + 3 = 66$

Q2) $4 \times 7 \times 4 - 3 = 28$

Q3) $3 + 4^2 \times 2 = 98$

Q4) $9 \times 6 - 8^3 = -72$

Q5) $8 - 8 \times 3 - 5^2 = -24$

Q6) $9 + 3 + 4^2 = 58$

BODMAS Code Breaker (1)

Use the BODMAS rules to answer each question. Remember to show your working.

A $2 + 2 \times 3$	B $6 + 4 \div 4$	C $16 + 2 \times 3$	D $11 - 10 \div 5$
E $17 - 4 \times 3$	F $(3 + 2) \times 4$	G $3 \times (2 + 5)$	H $3 + 1 + 9 - 2$
I $8 - (3 \times 2)$	J $9 + 3 \times 2$	K $65 - 3 \times 6$	L $15 + 5 - 2$
M $4 \times 3 \div 2$	N $13 + 3 \times 9$	O $6 - 54 \div 9$	P $34 + 7 \times 8$
Q $65 \div 5 + 2$	R $7 + 7 \times 6$	S $34 - 5 \times 6$	T $120 \div (6 + 4)$
U $7 + 3 \times 9$	V $200 \div (14 + 6)$	W $12 + 12 \times 4$	X $95 - 95 \div 5$
Y $33 + 33 \div 3$	Z $2 \times 3 + 56$		

Copy the table below into your jotter. Fill in the answers to the questions above in your table.

A	B	C	D	E	F	G	H	I	J	K	L	M

N	O	P	Q	R	S	T	U	V	W	X	Y	Z

Use this table to decode the message below.

12	11	5	49	5		8	49	5			
12	11	49	5	5		47	2	40	9	4		0	20
6	8	12	11	5	6	8	12	2	22	2	8	40	

12	11	0	4	5		60	11	0		22	8	40
22	0	34	40	12		8	40	9				
12	11	0	4	5		60	11	0		22	8	40	12

BODMAS Code Breaker (2)

Use the BODMAS rules to answer each question. Remember to show your working.

A   3 x 2 + 3 x 2   B   4 x 1 + 2 x 7   C   5 x 9 – 2 x 6

D   1 x 9 – 3 x 2   E   6 x 3 – 2 x 4   F   7 x 6 + 3 x 9

G   9 x 8 – 8 x 9   H   5 x 5 + 2 x 9   I   64 ÷ 8+ 3 x 2

J   90 ÷ 10 – 5 x 1   K   54 ÷ 6 + 3 x 7   L   4 + 2 x 1 + 3

M   56 ÷ 7 + 4 x 2   N   30 – 2 x 2 + 5   O   5 x 3 – 24 ÷ 6

P   88 ÷ 11 – 2 x 3   Q   (3 + 6) x 2 + 5   R   (12 – 4) x 8 – 3

S   (3 + 4) x 5 – 11   T   2 + 4 x (9 – 3)   U   34 + 9 x (11 – 3)

V   67 – 4 x (2 + 3)   W   17 + 3 x (16 – 9)   X   11 + 2 x (7 + 5)

Y   100 – 88 ÷ (5 + 6)   Z   12 + 2 x 3 – 3 x 1

Copy the table below into your jotter. Fill in the answers to the questions above in your table.

A	B	C	D	E	F	G	H	I	J	K	L	M

N	O	P	Q	R	S	T	U	V	W	X	Y	Z

Use this table to decode the message below.

14	26			43	12	2	2	10	31	24		
11	31	33	10		14	31		12				
16	14	31	106	26	10		26	38	14	33	10	
14	31		12		38	10	10	30		12	31	3
11	31	33	10		14	31		12		92	10	12	61

| 38 | 43 | 12 | 26 | | 14 | 24 | | 14 | 26 | ? |

bracketed

some of these need brackets to make them correct
copy them out and place brackets if and where they are needed

(1) $2 \times 3 + 7 = 20$

(2) $2 + 5 \times 6 = 32$

(3) $13 - 2 \times 5 = 55$

(4) $20 - 6 \div 2 = 7$

(5) $7 - 4 - 1 = 4$

(6) $10 - 4 + 2 = 4$

(7) $20 \div 4 \times 5 = 1$

(8) $15 \div 3 + 2 = 7$

(9) $9 - 2 \times 4 = 1$

(10) $7 \times 6 \div 2 = 21$

(11) $18 - 8 - 3 = 13$

(12) $20 \div 10 \div 2 = 1$

(13) $16 \div 8 \div 2 = 4$

(14) $20 - 5 - 2 - 1 = 18$

(15) $36 \div 2 \times 3 + 4 = 10$

(16) $3 + 2 \times 5 - 3 = 7$

(17) $4 \times 5 + 2 \times 3 = 44$

(18) $8 \div 4 + 4 \times 2 = 2$

(19) $15 - 4 - 2 - 1 = 12$

(20) $4 \times 5 + 10 \div 2 = 15$

order of operating

find the missing number

1.) $4 + ? \times 2 = 18$

2.) $5 + ? \div 2 = 8$

3.) $10 - ? \times 2 = 4$

4.) $5 + ? \div 3 = 10$

5.) $4 \times 5 - ? \div 2 = 15$

6.) $3 + ? \times 3 = 15$

7.) $6 + ? \div 2 = 8$

8.) $12 - ? \times 2 = 4$

9.) $7 + ? \div 3 = 10$

10.) $10 \times 6 - ? \div 2 = 20$

11.) $\dfrac{9 + ?}{3 + 2} = 3$

12.) $\dfrac{40 - 28}{10 - ?} = 3$

13.) $\dfrac{30 - 14}{12 - ?} = 4$

14.) $\dfrac{3 \times 8 - ?^2}{10 - 2 \times 3} = 2$

15.) $\dfrac{4 \times 9 - ?^2}{1 + 4 \times 2} = 3$

32