Multiple-choice section

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Answer | C | D | B | B | A | D | D | A | C | B | C | C |

Question 1 [2.1]

C

Factors of 42: 1, 2, 3, 6, 7, 14, 21, 42

8, 12 and 9 are not factors of 42.

Question 2 [2.2]

D

The first five prime numbers are 2, 3, 5, 7, 11

0, 1, 4 and 9 are not prime numbers.

Question 3 [2.5]

B

7 < 2 False

-8 < 14 True

-2 < -3 False

20 < -8 False

Question 4 [2.1]

B

12: 1, 2, 3, 4, 6, 12

16: 1, 2, 4, 8, 16

Common factors are 1, 2 and 4

Question 5 [2.5]

A

6 – 4 – 5 = 2 – 5 = -3

Question 6 [2.1]

D

For 543 687 to be divisible by 2, it must be an even number.

So not divisible by 2.

543 687 divisible by 3:

5 + 4 + 3 + 6 + 8 + 7 = 33

33 is divisible by 3

For 543 687 to be divisible by 6:

Must be divisible by 2 and divisible by 3

So not divisible by 6.

543 687 divisible by 9:

5 + 4 + 3 + 6 + 8 + 7 = 33

33 is not divisible by 9

Question 7 [2.4]

D

2, 3, 7, 11 is the only set of numbers in ascending order.

Set A and C are in no clear order.

Set B is in descending order.

Question 8 [2.6]

A

8 – (-4) = 8 + 4 = 12

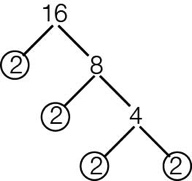
Question 9 [2.7]

C

-12 – (-2) – (+2) = -12 + 2 – 2

Question 10 [2.3]

B



2 × 2 × 2 × 2

Question 11 [2.2]

C

5, 23 and 19 are prime numbers. 30 is composite.  
The factors of 30 are 1, 2, 3, 5, 6, 10, 15, 30.  
38 is composite.  
The factors of 38 are 1, 2, 19, 38.

Question 12 [2.1]

C

8: 1, 2, 4, 8

12: 1, 2, 3, 4, 6, 12

HCF 4

Multiple-choice total marks: 12

Short answer section

Question 13 2 marks [2.1, 2.4]

(a) A number that divides exactly into another number is a *factor*.

(b) All whole numbers, both negative and positive and the number zero are known as *integers*.

Question 14 2 marks [2.2]

Two numbers are said to be co-prime if their highest common factor is 1.

3 and 4 are co-prime numbers as well as 7 and 15.

Question 15 3 marks [2.1]

|  |  |  |
| --- | --- | --- |
| (a) 6 and 8 6: 6, 12, 18, 24, 30 ... 8: 8, 16, 24, 32 ... LCM: 24 | (b) 4 and 6 4: 4, 8, 12, 16, 20 ... 6: 6, 12, 18 ... LCM: 12 | (c) 9 and 15 9: 9, 18, 27, 36, 45, 54 ... 15: 15, 30, 45, 60 ... LCM: 45 |

Question 16 3 marks [2.1]

|  |  |  |
| --- | --- | --- |
| (a) 18 and 32 18: 1, 2, 3, 6, 9, 18 32: 1, 2, 4, 8, 16, 32 HCF: 2 | (b) 36 and 54 36: 1, 2, 3, 4, 6, 9, 12, 18, 36 54: 1, 2, 3, 6, 9, 18, 27, 54 HCF: 18 | (c) 56 and 72 56: 1, 2, 4, 7, 8, 13, 28, 56 72: 1, 2, 3, 4, 6, 8, 9, 12, 24, 36, 72 HCF: 8 |

Question 17 3 marks [2.1]

(a) 60, 81, 435, 2892, 7296 (b) 60, 2892, 7296 (c) 7296

|  |  |  |  |
| --- | --- | --- | --- |
|  | ÷ 3 | ÷ 6 | ÷ 8 |
| 60 | 6 + 0 = 6  6 is ÷ 3, so 60 is ÷ 3 | Even and ÷ 3  So ÷ 6 | Not ÷ 8 |
| 81 | 8 + 1 = 9  9 is ÷ 3, so 81 is ÷ 3 | Not even  So not ÷ 6 | Not ÷ 8 |
| 435 | 4 + 3 + 5 = 12  12 is ÷ 3, so 435 is ÷ 3 | Not even  So not ÷ 6 | Not ÷ 8 |
| 2892 | 2 + 8 + 9 + 2 = 21  21 is ÷ 3, so 2892 is ÷ 3 | Even and ÷ 3  So ÷ 6 | Not ÷ 8 |
| 7296 | 7 + 2 + 9 + 6 = 24  24 is ÷ 3, so 7296 is ÷ 3 | Even and ÷ 3  So ÷ 6 | Last three digits is ÷ 8  So 7296 is ÷ 8 |

Question 18 2 marks [2.1]

Use the LCM of 12 and 10 to find the number of packets required.

12: 24, 36, 48, 60

10: 20, 30, 40, 50, 60

LCM is 60.

60 is the 4th multiple of 12, so 4 packets of cheese.

60 is the 5th multiple of 10, so 5 packets of bread rolls.

Question 19 2 marks [2.2]

31, 37, 41, 43, 47

Question 20 2 marks [2.2]

121, 122, 123, 124, 125, 126, 128, 129, 130, 132, 133, 134, 135, 136, 138

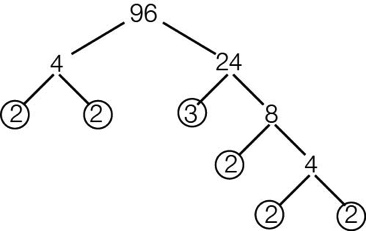
Question 21 3 marks [2.2]

(a) 14 and 15  
14: 1, 2, 7, 14  
15: 1,3, 5, 15  
HCF: 1, co-prime

(b) 14 and 21  
14: 1, 2, 7, 14  
21: 1, 3, 7, 21  
HCF: 7, not co-prime

(c) 15 and 28  
15: 1, 3, 5, 15  
28: 1, 2, 4, 7, 14, 28  
HCF: 1, co-prime

Question 22 2 marks [2.3]



96 = 25 × 3

Question 23 3 marks [2.3]

40: 2 × 2 × 2 × 5

72: 2 × 2 × 2 × 3 × 3

HCF: 2 × 2 × 2 = 8

Question 24 4 marks [2.3]

(a) 34 × 82 = 3 × 3 × 3 × 3 × 8 × 8 = 81 × 64 = 5184

(b) 24 × 33 × 52 = 2 × 2 × 2 × 2 × 3 × 3 × 3 × 5 × 5 = 16 × 27 × 25 = 432 × 25 = 10 800

Question 25 2 marks [2.4]

(a) 17, 11, 5 Subtracting 6 the next three numbers are -1, -7, -13.

(b) 26, 12, -2 Subtracting 14 the next three numbers are -16, -30, -44.

Question 26 3 marks [2.5]

(a) +10 – 5 = 5  
-9 + 8 = -1  
5 > -1

(b) -8 – 5 = -13  
-4 – 6 = -10  
-13 < - 10

(c) 0 + 2 = 2  
-5 + 8 = 3  
2 < 3

Question 27 2 marks [2.4]

-4, -2, 0, 2, 4, 14

Question 28 2 marks [2.4]

20, 5, -5, -15, -20, -25

Question 29 2 marks [2.4]

(a) 134 + 9 = 143 m

(b) 141 – 49 = 92 m

Question 30 3 marks [2.5]

(a) 6 + 8 + 14 = 14 + 14 = 28

(b) -4 + 3 + 2 = -1 + 2 = 1

(c) 19 – 15 – 11 = 4 – 11 = -7

Question 31 2 marks [2.5]

-3 + 12 – 5 – 9 + 7

= 9 – 5 – 9 + 7

= -5 + 7

= 2

The spider is 2 cm above the windowsill.

Question 32 3 marks [2.6]

(a) 12 + (-6) + (-4)  
= 12 – 6 – 4 = 6 – 4 = 2

(b) -3 + (-5) + (-6) = -3 – 5 – 6  
= -8 – 6 = -14

(c) 18 – (-8) – (-10)  
= 18 + 8 + 10  
= 26 + 10 = 36

Question 33 2 marks [2.6]

(a) -10 + (-4) = -14 is negative ten plus negative four equals negative fourteen.

(b) +9 – (-6) = +15 is positive nine subtract negative six equals positive fifteen.

Question 34 3 marks [2.5]

(a) -11 + 4 – 9  
= -7 – 9  
= -16

(b) 32 – 18 – 26  
= 14 – 26  
= -12

(c) -22 – 9 + 11  
= -31 + 11  
= -20

Question 35 2 marks [2.7]

35 + 50 + 20 + -10 + -25  
= 105 – 35  
= 70  
A $70 profit was made by the school canteen.

Question 36 2 marks [2.7]

(a) 30 – (-10) = 30 + 10  
True: two like signs means add.

(b) 15 + (-5) = 15 + 5  
False: two unlike signs means subtract.

Short answer total: 59

Extended answer section

Question 37 2 marks [2.7]

-28 + -41 + -54 + -57 + -58 + -60 + -60 + -60 + -51 + -39 + -28 = -536

-593 – (-536) = -57

April’s average temperature is -57°C.

Question 38 4 marks [2.1]

Using prime factors:

36 = 2 × 2 × 3 × 3

27 = 3 × 3 × 3

18 = 2 × 3 × 3

HCF = 3 × 3 = 9

There are 9 boxes with 9 donuts in each box.

Check by adding up the different type of donuts:

36 + 27 + 18 = 81

There are 81 donuts altogether.

36 ÷ 9 = 4

27 ÷ 9 = 3

18 ÷ 9 = 2

There are 4 chocolate donuts, 3 strawberry donuts and 2 caramel donuts in each box.

Question 39 4 marks [2.2]

|  |  |
| --- | --- |
| Three consecutive prime numbers | Six consecutive prime numbers |
| 2 + 3 + 5 = 10, not prime |  |
| 3 + 5 + 7 = 15, not prime |  |
| 5 + 7 + 11 = 23 prime, but six consecutive prime numbers will not equal 23 |  |
| 11+13+17 = 41 prime | 2 + 3 + 5 + 7 + 11 + 13 = 41 prime |

The smallest prime number that can be expressed as the sum of 3 consecutive prime numbers as well as 6 consecutive prime numbers is 41.

Question 40 2 marks [2.2]

The multiples of 13 are: 13, 26, 39, 52 ...

Adding a multiple of 13 to 61: 61 + 39 = 100.

Alternatively, using algebra to find the multiple:

61 + *x* = 100

*x* = 39

Charlie is 61 years of age.

Question 41 3 marks [2.6]

Many solutions possible. Sample solutions:

(a) 50  
Card C + Card C + Card C + Card C + Card C + Card C + Card B – Card 1  
9 + 9 + 9 + 9 + 9 + 9 + -3 -1 = 50

(b) 38 using only four cards  
Card C – Card D + Card 1 + Card 1  
9 – -27 + 1 + 1 = 38

(c) -11  
Card D + Card C + Card C – Card A – Card A  
-27 + 9 + 9 – 1 – 1 = -11

Extended answer total: 17

TOTAL test marks: 87