1.1 Number: Integers and Powers: Test Pack

Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write these integers in order, starting with the smallest.
-8, 3, -1, 0, -5, 6

(2)

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2 Work out 966 x 16.

(3)

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3 Write down all the factors of 64.

(2)

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4 Index notation links a power to repeated multiplication.

(a) Write 7 x 7 x 7 as a single power of 7, and work out its value. **(2)**

(b) Write 6^3 as repeated multiplication, and work out its value. **(2)**

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5 Work out 13 - 2.

(1)

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6 From the list 21, 23, 27, 29, 33, 37, write down all the prime numbers.

(2)

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7 Multiples of a number are found by multiplying it by 1, 2, 3, and so on.

(a) List the first six multiples of 9. **(2)**

(b) Find the lowest common multiple of 6 and 8 by listing multiples of each number. **(2)**

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8 Prime factors can be used to find the highest common factor (HCF) of two numbers.

(a) Write 84 as a product of its prime factors, giving your answer in index form. **(2)**

(b) Write 126 as a product of its prime factors, giving your answer in index form. **(2)**

(c) Use your answers to parts a and b to find the highest common factor of 84 and 126. **(2)**

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9 Use the correct order of operations (BIDMAS) to work out each expression.

(a) $3 + 2^3 \times 4$ **(2)**

(b) $(7 - 2)^2 - 10$ **(2)**

(c) $40 / 2^3 + 1$ **(2)**

10 List the first five multiples of 9.

(2)

11 Simplify or work out the value of each expression.

(a) Simplify $7^8 / 7^3$, giving your answer as a single power of 7. **(2)**

(b) Simplify $(4^2)^3$, giving your answer as a single power of 4. **(2)**

(c) Work out the value of $6^5 / 6^3$. **(2)**

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12 Prime factors can also be used to find the lowest common multiple (LCM) of two numbers. Given that $18 = 2 \times 3^2$ and $24 = 2^3 \times 3$, find the LCM of 18 and 24.

(3)

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13 Simplify $5^3 \times 5^2$, giving your answer as a single power.

(1)

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14 Powers of 10 are used to write very large numbers in a compact form.

(a) Write 4,500,000 in the form $A \times 10^n$, where $1 \leq A < 10$. **(2)**

(b) Work out the value of $3 \times 10^4 \times 2 \times 10^2$, giving your answer as an ordinary number. **(2)**

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Mark scheme · 1.1 Number: Integers and Powers: Test Pack

Question 1

at least four of the six values placed in correct relative order (oe)	B1
fully correct order -8, -5, -1, 0, 3, 6 cao	B1

Answer: **-8, -5, -1, 0, 3, 6**

Question 2

one correct partial product, eg 966 x 6 = 5796 or 966 x 10 = 9660	M1
both partial products attempted and added	M1
15456 cao	A1

Answer: **15456**

Question 3

at least half of the factors correct, with no more than one incorrect value	M1
1, 2, 4, 8, 16, 32, 64 cao	A1

Answer: **1, 2, 4, 8, 16, 32, 64**

Question 4

(a) 7^3 cao	B1
(a) 343 cao	B1
(a) Answer: **$7^3 = 343$**	
(b) 6 x 6 x 6 cao	B1
(b) 216 cao	B1
(b) Answer: **6 x 6 x 6 = 216**	

Question 5

11 cao	B1

Answer: **11**

Question 6

at least two of 23, 29, 37 identified correctly with no non-primes included	B1
all three of 23, 29, 37 identified, and no others, cao	B1

Answer: **23, 29, 37**

Question 7

(a) at least four correct multiples listed	B1
(a) fully correct list 9, 18, 27, 36, 45, 54 cao	B1
(a) Answer: **9, 18, 27, 36, 45, 54**	
(b) list multiples of both 6 and 8 until a common value appears (oe)	M1
(b) 24 cao	A1
(b) Answer: **24**	

Question 8

(a) correct prime factors identified: 2, 2, 3, 7	M1
(a) 2^2 x 3 x 7 cao (factors in any order)	A1
(a) Answer: **2^2 x 3 x 7**	
(b) correct prime factors identified: 2, 3, 3, 7	M1
(b) 2 x 3^2 x 7 cao (factors in any order)	A1
(b) Answer: **2 x 3^2 x 7**	
(c) select the lowest power of each common prime factor (2^1, 3^1, 7^1) (ft)	M1
(c) 42 cao (ft)	A1
(c) Answer: **42**	

Question 9

(a) evaluate $2^3 = 8$ and multiply by 4 to get 32, before adding (oe)	M1
(a) 35 cao	A1
(a) Answer: **35**	
(b) evaluate the bracket first (7-2=5) then square to get 25 (oe)	M1
(b) 15 cao	A1
(b) Answer: **15**	
(c) evaluate $2^3 = 8$, then divide 40 by 8 to get 5 (oe)	M1
(c) 6 cao	A1
(c) Answer: **6**	

Question 10

9, 18, 27, 36, 45 (B1 for at least three correct in order)	B2

Answer: **9, 18, 27, 36, 45**

Question 11

(a) subtract the indices, 8-3 (oe)	M1
(a) 7^5 cao	A1
(a) Answer: **7^5**	
(b) multiply the indices, 2x3 (oe)	M1
(b) 4^6 cao	A1
(b) Answer: **4^6**	
(c) simplify to 6^2 (oe)	M1
(c) 36 cao	A1
(c) Answer: **36**	

Question 12

takes the highest power of each prime: 2^3 and 3^2 (or lists multiples of 18 and 24 up to 72)	M1
LCM = 2^3 x 3^2 (or identifies 72 as the first common multiple)	M1
72 cao	A1

Answer: **72**

Question 13

5^5 cao	B1

Answer: **5^5**

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Question 14

(a) A = 4.5 identified (oe)	**M1**
(a) 4.5×10^6 cao	**A1**

(a) Answer: **4.5×10^6**

(b) multiply the coefficients (3x2=6) and add the indices of 10 (4+2=6) to get 6×10^6 (oe)	**M1**
(b) 6,000,000 cao	**A1**

(b) Answer: **6,000,000**

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