FOUNDATION

1.8 Negative Numbers: Test Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Here is a number line.



(a) Write down the number that the arrow is pointing to. **(1)**

.....

(b) Write these numbers in order, starting with the smallest: 3, -5, 0, -8, 6 **(1)**

.....

(Total for Question 1 is 2 marks)

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2 Insert < or > to make each statement correct.

(a) -3 [ ] -7 **(1)**

(b) -2 [ ] 5 **(1)**

(Total for Question 2 is 2 marks)

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3 Zara's working for -12 / (-4) is shown below.

Step 1: 12 / 4 = 3

Step 2: A negative divided by a negative gives a negative answer.

Step 3: Answer: -3

(a) Zara's final answer is wrong. Write down the correct answer. **(1)**

.....

(b) Identify the step where Zara's reasoning is wrong, and explain the mistake she has made. **(1)**

.....

(Total for Question 3 is 2 marks)

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4 Write True or False for each statement.

(a) -15 < -20 **(1)**

(b) -3 > -3.5 **(1)**

(Total for Question 4 is 2 marks)

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5 Work out 2 - (-5).

(Total for Question 5 is 1 mark)

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6 A submarine is at a depth of -120 metres. It rises 45 metres, then dives a further 68 metres.

(a) Work out the depth of the submarine now. **(3)**

.....

(b) The submarine must stay no lower than -150 metres to avoid a reef. Determine, showing your working, whether the submarine is above the reef. **(2)**

(Total for Question 6 is 5 marks)

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7 Work out -15 / 5

(Total for Question 7 is 1 mark)

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8 A function machine works like this: input -> multiply by -3 -> add 7 -> output.

(a) The input is -4. Work out the output. **(2)**

.....

(b) The output is -2. Work out the input. **(2)**

.....

(Total for Question 8 is 4 marks)

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9 Work out (-3) x (-5).

(Total for Question 9 is 1 mark)

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10 Put these numbers in order from smallest to largest: -3, 2, -8, 0.

(Total for Question 10 is 1 mark)

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11 The temperature at midnight was -6°C. By midday it had risen by 11 degrees. What was the temperature at midday?

(Total for Question 11 is 1 mark)

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12 Find the missing number: -6 + ___ = 3.

(Total for Question 12 is 1 mark)

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13 The table shows the midday temperature in five UK cities on 15 January.
Aberdeen: -3°C Belfast: 0°C Cardiff: 2°C Leeds: -1°C Norwich: -6°C
Put the cities in order of temperature, coldest first.

(Total for Question 13 is 1 mark)

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14 A scientist records the temperature of a chemical sample during an experiment. The sample starts at 18°C. During cooling stage 1, the temperature falls by 25°C. During cooling stage 2, the temperature falls by a further 9°C.

(a) Work out the temperature of the sample after both cooling stages. **(3)**

.....

(b) The experiment is only valid if the final temperature is below -20°C. Chen says the experiment is valid. Determine, showing your working, whether Chen is correct. **(2)**

(Total for Question 14 is 5 marks)

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15 Calculate (-4) x 3 + 7.

(Total for Question 15 is 2 marks)

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16 Work out (-3) x 4 + (-2) x (-5).

(Total for Question 16 is 2 marks)

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17 A pupil says: '-8 is bigger than -3, because 8 is bigger than 3.' Is the pupil correct? Give a reason for your answer.

(Total for Question 17 is 2 marks)

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18 Kwame has a bank balance of -£28. He pays in £50 and then a direct debit of £17 is taken. What is his final balance?

(Total for Question 18 is 3 marks)

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19 A pupil's working for -7 - (-12) is shown below.
Working: -7 - (-12) = -7 - 12 = -19
Identify the mistake in the pupil's working and work out the correct answer.

(Total for Question 19 is 2 marks)

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20 This question has three parts. Follow the instructions in each part.

(a) Evaluate (-3)(4 - 9). **(2)**

.....

(b) Hence or otherwise evaluate 15 + (-12) / 4. **(2)**

.....

(c) Write your answer from part (b) as an integer. State whether this integer is positive, negative or zero. **(2)**

(Total for Question 20 is 6 marks)

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Mark scheme · 1.8 Negative Numbers: Test Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

(a) -6 cao **B1**

(a) Answer: -6

(b) -8, -5, 0, 3, 6 oe (all five numbers correctly ordered) **B1**

(b) Answer: -8, -5, 0, 3, 6

Question 2

(a) > cao **B1**

(a) Answer: -3 > -7

(b) < cao **B1**

(b) Answer: -2 < 5

Question 3

(a) 3 cao **B1**

(a) Answer: 3

(b) correct step identified with correct explanation oe, e.g. 'Step 2 is wrong: a negative divided by a negative gives a positive answer, not a negative one' or equivalent valid reasoning **B1**

(b) Answer: Step 2 is wrong: dividing a negative number by a negative number gives a positive answer, not a negative one, so the answer should be 3, not -3.

Question 4

(a) False cao **B1**

(a) Answer: False

(b) True cao **B1**

(b) Answer: True

Question 5

7 cao **B1**

Answer: 7

Question 6

(a) -120 + 45 (= -75) oe **M1**

(a) -75 - 68 (their value - 68) oe **M1**

(a) -143 (m) cao **A1**

(a) Answer: -143 metres

(b) correct comparison of -143 and -150 shown, ft from (a) **M1**

(b) correct conclusion with reason, e.g. 'Yes, -143 > -150 so the submarine is above the reef' cso ft **A1**

(b) Answer: Yes; -143 is greater than -150 (7 m above the reef).

Question 7

-3 cao **B1**

Answer: -3

Question 8

(a) -4 x (-3) = 12 seen **M1**

(a) 19 cao **A1**

(a) Answer: 19

(b) correct reverse method, e.g. -2 - 7 = -9 seen **M1**

(b) 3 cao **A1**

(b) Answer: 3

Question 9

15 cao **B1**

Answer: 15

Question 10

-8, -3, 0, 2 cao **B1**

Answer: -8, -3, 0, 2

Question 11

5°C cao **B1**

Answer: 5°C

Question 12

9 cao **B1**

Answer: 9

Question 13

Norwich, Aberdeen, Leeds, Belfast, Cardiff cao **B1**

Answer: Norwich, Aberdeen, Leeds, Belfast, Cardiff

Question 14

(a) 18 - 25 (= -7) oe **M1**

(a) their value - 9 oe **M1**

(a) -16 (°C) cao **A1**

(a) Answer: -16°C

(b) correct comparison of -16 and -20 shown, ft from (a) **M1**

(b) correct conclusion with reason, e.g. 'No, -16 is greater than -20 so the final temperature is not below -20°C and the experiment is not valid' cso ft **A1**

(b) Answer: No; Chen is not correct, since -16 is greater than -20 so the temperature is not below -20°C.

Question 15

multiply (-4) x 3 to get -12 or show method oe **M1**

-5 cao **A1**

Answer: -5

Question 16

both products evaluated: -3 x 4 = -12 and -2 x -5 = 10 seen oe **M1**

-2 cao **A1**

Answer: -2

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Question 17

No (correct judgement) cao	**B1**
correct reason, e.g. -8 is further from zero / further to the left on the number line than -3, so -8 is less than -3 oe	**B1**

Answer: No. -8 is less than -3, because -8 is further left on the number line (further below zero).

Question 18

correctly add deposit: -28 + 50 seen or stated	**M1**
correctly subtract the direct debit: (-28 + 50) - 17 or equivalent ft	**M1**
£5 cao	**A1**

Answer: £5

Question 19

identify the error: the pupil treated -(-12) as -12 instead of +12 oe	**M1**
5 cao	**A1**

Answer: Mistake: -(-12) should become +12, not -12. Correct answer: 5.

Question 20

(a) work shown: 4 - 9 = -5 or equivalent method	**M1**
(a) 15 cao	**A1**

(a) Answer: 15

(b) division done: (-12) / 4 = -3 or equivalent	**M1**
(b) 12 cao	**A1**

(b) Answer: 12

(c) 12 cao	**B1**
(c) statement that 12 is positive, with brief reason (e.g. greater than 0) oe	**B1**

(c) Answer: 12; positive

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