2.31 Fractions, Decimals and Percentages Depth: 30-minute Pack

GL ASSESSMENT EP.M30 · Calculators not allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

Fractions, Decimals and Percentages Depth

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A deeper 11+ fractions, decimals and percentages paper for scholarship-level preparation, complementing EP.M3 (Fractions), EP.M4 (Decimals), EP.M5 (Percentages) and EP.M24 (Fractions, Decimals and Percentages Mixed Drill). It covers equivalence, ordering across all three forms, all four operations with fractions (including mixed numbers), conversions between forms, finding fractions and percentages of amounts, and worded and multi-step problems. Questions are ramped from straightforward warm-up items to demanding multi-step and reverse-reasoning problems designed to stretch the strongest candidates.

1 Calculate 1 1/2 + 2 2/3, giving your answer as a mixed number in its simplest form.

(3)

2 Calculate 3 1/4 - 1 5/6, giving your answer as a mixed number in its simplest form.

(3)

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3 What is 45% of 160?

- ☐ A) 45
- ☐ B) 115
- ☐ C) 72
- ☐ D) 64
- ☐ E) 80

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4 Priti invests £46. Her investment increases in value by 15%. Work out the new value of her investment.

(2)

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5 Express 24 as a percentage of 40.

(2)

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6 Aisha has £120. She spends 3/8 of it on a jacket. She then spends 20% of what remains on a book. How much money does she have left?

(3)

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7 Which of these is NOT equal to 1/4?

- ☐ A) 2/8
- ☐ B) 3/10
- ☐ C) 25%
- ☐ D) 5/20
- ☐ E) 0.25

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8 Calculate 2/5 + 1/3, giving your answer as a fraction in its simplest form.

(2)

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9 Calculate 3/4 - 5/12, giving your answer as a fraction in its simplest form.

(2)

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10 Calculate 3/4 x 2/9, giving your answer in its simplest form.

- ☐ A) 5/13
- ☐ B) 2/3
- ☐ C) 1/6
- ☐ D) 1/12
- ☐ E) 2/9

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11 Which fraction is equivalent to 3/4?

- ☐ A) 9/16
- ☐ B) 4/3
- ☐ C) 6/8
- ☐ D) 3/8
- ☐ E) 5/6

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12 Write 0.35 as a fraction in its simplest form.

- ☐ A) 35/100
- ☐ B) 7/20
- ☐ C) 7/10
- ☐ D) 3/5
- ☐ E) 7/2

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13 Order these four values from smallest to largest: 7/10, 68%, 0.72, 71%

(2)

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14 Which of these fractions is closest in value to 1/2?

- ☐ A) 9/19
- ☐ B) 5/9
- ☐ C) 7/15
- ☐ D) 4/11
- ☐ E) 6/13

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15 Tom has £200 in a savings account. During January, his savings increase by 10%. During February, his savings then decrease by 10%.

(a) Work out how much money Tom has at the end of February. **(3)**

(b) Explain why the answer to part (a) is not £200. **(1)**

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16 A water tank is 3/8 full. After 45 litres of water are added, the tank becomes 5/8 full. Work out the total capacity of the tank.

(3)

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Mark scheme · 2.31 Fractions, Decimals and Percentages Depth: 30-minute Pack

Question 1

converts both to improper fractions: 3/2 and 8/3 **M1**

correct common denominator 6, e.g. 9/6 + 16/6 **M1**

4 1/6 cao **A1**

Answer: 4 1/6

Question 2

converts both to improper fractions: 13/4 and 11/6 **M1**

correct common denominator 12, e.g. 39/12 - 22/12 **M1**

1 5/12 cao **A1**

Answer: 1 5/12

Question 3

C (72) cao **B1**

Answer: C) 72

Question 4

finds 15% of £46 = £6.90, oe (e.g. uses 1.15 x 46) **M1**

£52.90 cao **A1**

Answer: £52.90

Question 5

24/40 converted to a fraction out of 100, or equivalent method **M1**

60% cao **A1**

Answer: 60%

Question 6

3/8 of £120 = £45, so £75 remains after the jacket **M1**

20% of £75 = £15 **M1**

£60 cao **A1**

Answer: £60

Question 7

B (3/10) cao **B1**

Answer: B) 3/10

Question 8

correct common denominator 15 with equivalent fractions 6/15 and 5/15 **M1**

11/15 cao **A1**

Answer: 11/15

Question 9

correct common denominator 12, e.g. 9/12 - 5/12 **M1**

1/3 cao (simplified from 4/12) **A1**

Answer: 1/3

Question 10

C (1/6) cao **B1**

Answer: C) 1/6

Question 11

C (6/8) cao **B1**

Answer: C) 6/8

Question 12

B (7/20) cao **B1**

Answer: B) 7/20

Question 13

converts all four values to the same format, e.g. decimals 0.70, 0.68, 0.72, 0.71 **M1**

68%, 7/10, 71%, 0.72 cao **A1**

Answer: 68%, 7/10, 71%, 0.72

Question 14

A (9/19) cao **B1**

Answer: A) 9/19

Question 15

(a) finds the value after January: 200 x 1.1 = 220 (oe 200 + 20) **M1**

(a) applies the 10% February decrease to 220, e.g. 220 x 0.9 **M1**

(a) £198 cao **A1**

(a) Answer: £198

(b) correct explanation that the 10% decrease is taken from the larger amount, £220, removing £22, which is more than the £20 added by the 10% increase on £200, oe **B1**

(b) Answer: The 10% decrease in February is worked out on £220 (removing £22), which is more than the £20 added by the 10% increase in January, so the two changes do not cancel out.

Question 16

recognises that 45 litres represents 5/8 - 3/8 = 1/4 of the tank's capacity **M1**

sets up 1/4 x capacity = 45, oe (e.g. capacity = 45 / (1/4)) **M1**

180 litres cao **A1**

Answer: 180 litres

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