



H22-test Weighted and Geometric Mean: Test Pack

EDEXCEL 1ST0 · Calculator allowed · about 20 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A talent show has three judges. Each judge gives a contestant a score out of 10, but the judges' scores are combined using weights that reflect each judge's experience:

Judge	Score	Weight
A	9	1
B	6	2
C	5	3

The weighted mean score is defined as:

weighted mean = (sum of (score x weight)) / (sum of weights)

- (a) Work out the sum of (score x weight) for the three judges. (2)

- (b) Hence work out the weighted mean score. (2)

(Total for Question 1 is 4 marks)

2 The geometric mean of three positive numbers a , b and c is defined as:

geometric mean = cube root of $(a \times b \times c)$

(a) Find the geometric mean of 2, 4 and 8. (2)

.....
(b) Find the geometric mean of 5, 10 and 20. (2)

.....
(Total for Question 2 is 4 marks)

3 A college course has three assessed components, each with a different weighting towards the final course percentage:

Component	Weighting	Student's score (%)
Coursework	20%	84
Practical	30%	70
Final exam	50%	62

(a) Work out the simple (unweighted) mean of the student's three percentage scores. (2)

.....
(b) Work out the student's weighted mean percentage for the course, using the weightings shown. (3)

.....
(c) Explain why the weighted mean in part (b), rather than the simple mean in part (a), should be used as the student's overall course percentage. (1)

(Total for Question 3 is 6 marks)

4 The geometric mean of the three positive numbers 5, 8 and x is 10.

(a) Show that $5 \times 8 \times x = 1000$. (1)

(b) Hence find the value of x . (2)

(c) The geometric mean of two positive numbers, y and 18, is 12. Find the value of y . (2)

(Total for Question 4 is 5 marks)

Mark scheme · H22-test Weighted and Geometric Mean: Test Pack

Question 1

- (a) **M1** $9 \times 1, 6 \times 2, 5 \times 3$ (= 9, 12, 15), oe (correct products)
- (a) **A1** 36 cao
- (a) **Answer: 36**
- (b) **M1** $36 / (1+2+3)$, oe (divides by the sum of the weights)
- (b) **A1** 6 cao
- (b) **Answer: 6**

Question 2

- (a) **M1** $2 \times 4 \times 8$ (=64), oe
- (a) **A1** 4 cao
- (a) **Answer: 4**
- (b) **M1** $5 \times 10 \times 20$ (=1000), oe
- (b) **A1** 10 cao
- (b) **Answer: 10**

Question 3

- (a) **M1** $(84+70+62)/3$, oe
- (a) **A1** 72 (%) cao
- (a) **Answer: 72%**
- (b) **M1** $84 \times 0.20, 70 \times 0.30, 62 \times 0.50$ (=16.8, 21, 31), oe
- (b) **M1** $16.8 + 21 + 31$, dep (sums the weighted components)
- (b) **A1** 68.8 (%) cao
- (b) **Answer: 68.8%**
- (c) **B1** the components do not count equally towards the final course grade (the exam is worth 50%, more than the other two components combined are individually), so the weighted mean reflects the true structure of the course, oe; the simple mean wrongly treats all three components as equally important
- (c) **Answer: The weighted mean is correct because the three components carry different importance (20%, 30%, 50%) towards the final grade; the simple mean incorrectly treats them as equally important.**

Question 4

- (a) **B1** cubing both sides of geometric mean = cube root of $(5 \times 8 \times x)$: $10^3 = 5 \times 8 \times x$, so $5 \times 8 \times x = 1000$, cso
- (a) **Answer: $5 \times 8 \times x = 1000$**
- (b) **M1** $40x = 1000$, ft from (a)
- (b) **A1** 25 cao
- (b) **Answer: $x = 25$**
- (c) **M1** $12^2 = 18y$ (=144), oe
- (c) **A1** 8 cao
- (c) **Answer: $y = 8$**