Marked candidate answers

Level 3 Mathematical Studies

Introduction

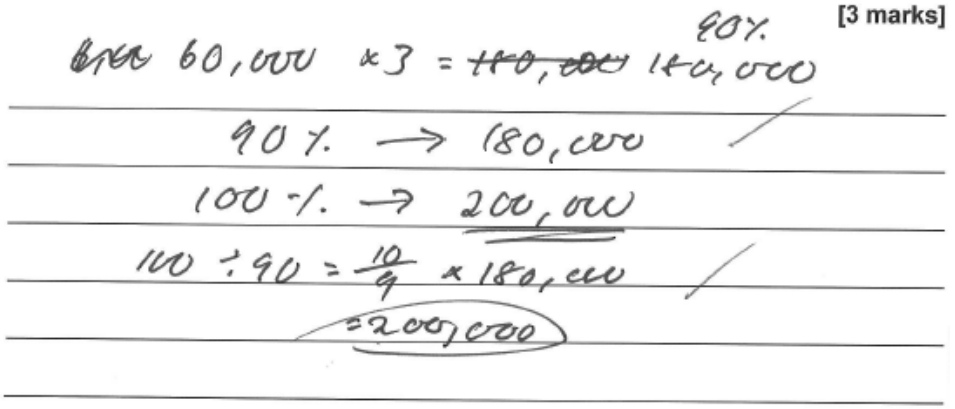
This document shows a selection of different candidate answers from paper 1 of our specimen assessment material. Each answer below received full marks.

Pete wants to buy a house.

His annual salary is £60 000 .
The bank will lend him 3 times his annual salary for a mortgage.
This is 90% of the house price.

What is the price of the house?

[3 marks]



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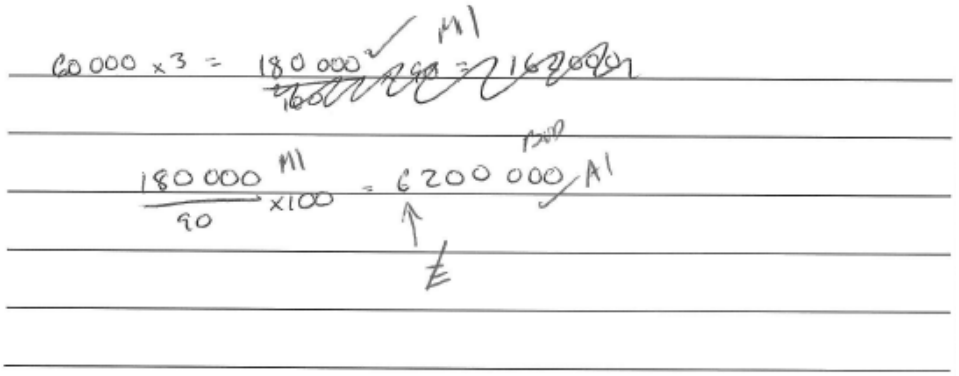

Estimate the number of heartbeats an adult human has in one year.

Show details of your assumptions and calculations.

[5 marks]

72 beats per minute B1

1 year = 365 days = 60s x 60 = 3600s in an hour

3600 x 24 = 86400s a day x 365 = 31536000s

$31536000 \times \frac{72}{60}$ = M1

M1 A1

72 x 525600 = 37843200 beats a year A1

Estimate the number of heartbeats an adult human has in one year. 3

Show details of your assumptions and calculations.

[5 marks]

Number of heartbeats per minute: 100 B1

heartbeats per hour = 100 x 60 = 60,000

beats per day = 6000 x 24 = 144,000

Beats per year = 144,000 x 365 days = 52560000

M1

M1 A1

HeartBeats per year = 52560000

A1

Sam invests £1000 in a savings account.

The compound interest rate is 4% each year.

How many years will it take for the value of his investment to double?

[3 marks]

$1000 \times 1.04^{18} = £2025.82$

It will take Sam roughly 18 years for his investment to double.

Sam invests £1000 in a savings account.

The compound interest rate is 4% each year.

How many years will it take for the value of his investment to double?

[3 marks]

$1000 \times 1.04 = 1040$

$1000 \times 1.04^2 = 1081.6$

$1000 \times 1.04^3 = 1124.86$

$1000 \times 1.04^5 = 1216.65$

$1000 \times 1.04^{13} = 1665.07$ 18 years

$1000 \times 1.04^{18} = 2025.82$

Estimate how far a human being is likely to walk in their lifetime.
Show details of your assumptions and calculations.

[6 marks]

10 years: ~~2000 metres~~ 2 miles a day. B1

2 x 30 = 60 miles a month.

60 x 12 = 720 miles a year. M1

720 miles x 70 B1 = 50400 miles

in a average lifetime. m1 A1

A1

Estimate how far a human being is likely to walk in their lifetime.
Show details of your assumptions and calculations.

[6 marks]

Kids = 1000

8,000 steps/day ~~6 steps~~ 3 steps = 1 meter

2666.6 meter

Age

15-45 = 2667/day

1 - 3 = 5000 steps = 166.6 = 167/day

4 - 6 = 8000 steps = 2666 = 2667/day

46 - 55 = 4000 steps = 1333.3 = 1333m/day

7 - 14 = 5000 = 1666.6 = 1667/day

365 x 2 = 730

730 121910

167 x 2 = 334m in 2yr

730 194910

267 x 2 = 534m in 2yr

2555 425 9185

1667 x 3 = 1667m in 7yr

365 x 7 = 2555

365 x 30 = 10950

365 x 39 = 3336

14235

2667 x 10950 = 29203650m 30yr

1333 x 14235 = 18975255 in 39yr.

52579410m