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]

£ 60,000 × 3 = 180,000 180,000   90%

90% → 180,000

100% → 200,000

100 ÷ 90 = $\frac{10}{9}$ × 180,000

= 200,000

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]

60 000 × 3 = 180 000   ÷ 90 = 162 000

180 000 / 90 × 100 = £200 000

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 = 31536005

$\frac{31536000 \times 72}{60}$ = M1 M1 A1

72 x 525600 = 37843200 beats a year A1

3

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

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 = 5% 52560000 M1

MI A1

Heart Beats per year = 52,560,000 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 some 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]

$1000 \times 1.04 = 1040$

$1000 \times 1.04^2 = 1086.6$

$1000 \times 1.04^3 = 1124.86$

$1000 \times 1.04^5 = 1216.65$

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

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

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

[6 marks]

70 years. ~~also~~ ~~meter~~ 2 miles a day. B1

2 × 30 = 60 miles a month.

60 × 12 = 720 miles a year. M1

720 miles × 70 B1 = 50 400 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]

kats = 1000

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

$\dfrac{8,000}{3}$ 2666.6 meter

Age   15-45 ≈ 2667/day

1 - 3 = $\dfrac{500 \text{ steps}}{3}$ · 166.6 = 167/day

4 - 6 = $\dfrac{800 \text{ steps}}{3}$ = 2666 = 267/day

46 - 85 = $\dfrac{4000 \text{ steps}}{3}$ = 1333.3 = 1333 m/day

7 - 14 = $\dfrac{5000}{3}$ = 1666.6 = 1667/day

365 × 2 = 730

167 × $\dfrac{730}{2}$ = 334 m in 2 yr   121910   365 × 7 = 2555

267 × $\dfrac{730}{2}$ = 534 m in 2 yr   194910   365 × 30 = 10950

1667 × $\dfrac{2555}{3}$ = ... m in 7 yr   4259185   365 × 39 = 226

                                             14235

2667 × 10950 = 29203650 m 30 yr

1333 × 14235 = 18975255 in 39 yr.

52579410 m.