Festive GCSE Maths Challenge



Name: _____

Class/Section: _____

Exercise 1

In a Boxing Day sale, an artificial Christmas tree is offered at a 35% discount.
The sale price of the tree is £110.50.

Work out the original price of the Christmas tree before the sale.

[3 marks]



Exercise 2

The organising committee of a school Christmas fair invests £4,200 of their proceeds into a savings account paying 4.5% per annum compound interest.

Calculate the total amount in the account after 3 years.
Give your answer correct to the nearest penny.

[3 marks]



Exercise 3

A bakery prepares gingerbread biscuits and mince pies for a festive market in the ratio 5 : 3.
Each gingerbread biscuit uses 45 g of flour and each mince pie uses 65 g of flour.
The bakery makes 240 mince pies in total.

Work out the total mass of flour used, in kilograms.

[4 marks]



Exercise 4

A school Christmas fair stalls team wants to buy packs of festive fairy lights.
Two local suppliers offer the following deals:

- **Supplier A:** Pack of 300 lights for £13.50
- **Supplier B:** Pack of 450 lights for £19.80

Show which supplier offers the better value for money.
You must show all your working. **[4 marks]**



Exercise 5

A delivery van brings Christmas hampers from a distribution centre to a school.
The van departs at 09:40 and arrives at 11:16.
The average speed of the van during the journey is 45 km/h.

Work out the total distance travelled by the van.

[4 marks]



Exercise 6

A festive display banner is in the shape of a rectangle joined to a triangle along one side.
The rectangular section has a length of 2.8 m and a height of 1.4 m.
The triangle extends from the right-hand side of the rectangle, with a base of 1.2 m and the same height of 1.4 m.
Each square metre of banner requires £6.50 worth of decorative fabric.

Calculate the total cost of fabric needed for the banner.
Give your answer to 2 decimal places. **[5 marks]**



Exercise 7

A cylindrical festive candle has a diameter of 8 cm and a height of 15 cm.
The wax used to make the candle has a density of 0.9 g/cm³.



(a) Calculate the volume of the candle in cm³.
Give your answer in terms of π. **[2 marks]**

(b) Work out the mass of the candle, in grams, to 3 significant figures. **[3 marks]**

[Total: 5 marks]

Exercise 8

At the school Christmas fair, a raffle stall charges £x for a standard ticket and £$(2x - 0.50)$ for a premium gold ticket.
Amir buys 4 standard tickets and 3 premium gold tickets.
His total expenditure on tickets is £18.50.



(a) Set up and solve an equation to find the value of x. **[4 marks]**

(b) Hence, work out the cost of one premium gold ticket. **[1 mark]**

[Total: 5 marks]

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Total: 33 marks · M = method · A = accuracy · B = independent mark · accept equivalent methods

Exercise 1 [3 marks]

Answer: £170

100% − 35% = 65%	M1
110.50 ÷ 0.65	M1
£170	A1

Exercise 2 [3 marks]

Answer: £4,792.90

Multiplier 1.045	M1
4200×1.045^3 (= 4792.897…)	M1
£4,792.90	A1

Exercise 3 [4 marks]

Answer: 33.6 kg

Gingerbread: 240 ÷ 3 × 5 = 400	M1
400 × 45 = 18,000 g	M1
240 × 65 = 15,600 g	M1
33,600 g = 33.6 kg	A1

Exercise 4 [4 marks]

Answer: Supplier B

A: 13.50 ÷ 300 = 4.5p per light	M1
B: 19.80 ÷ 450 = 4.4p per light	M1
Valid comparison (any method)	M1
Supplier B, with correct values	A1

Exercise 5 [4 marks]

Answer: 72 km

09:40 to 11:16 = 1 h 36 min	M1
36 min = 0.6 h, so 1.6 h	M1
45 × 1.6	M1
72 km	A1

Exercise 6 [5 marks]

Answer: £30.94

Rectangle: 2.8 × 1.4 = 3.92 m²	M1
Triangle: ½ × 1.2 × 1.4 = 0.84 m²	M1
Total area 4.76 m²	A1
4.76 × 6.50	M1
£30.94	A1

Exercise 7 [5 marks]

Answer: (a) 240π cm³ (b) 679 g

(a) $\pi \times 4^2 \times 15$	M1
(a) 240π cm³	A1
(b) 240π × 0.9	M1
(b) 216π = 678.58…	A1
(b) 679 g (3 s.f.)	B1

Exercise 8 [5 marks]

Answer: (a) x = 2 (b) £3.50

(a) 4x + 3(2x − 0.50) = 18.50	M1
(a) 4x + 6x − 1.50 = 18.50	M1
(a) 10x = 20	M1
(a) x = 2	A1
(b) 2 × 2 − 0.50 = £3.50 (ft)	B1