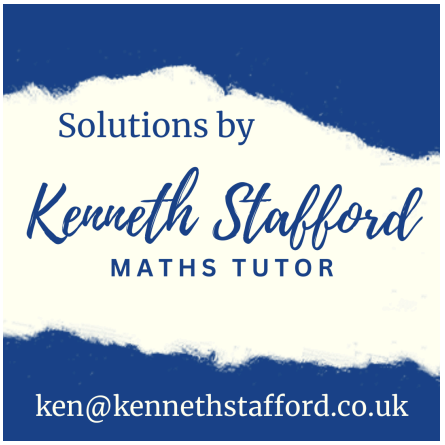
SOLUTIONS

Name: _____

GCSE (1 - 9)

Estimating





These questions are compiled from *released* Pearson Edexcel GCSE maths exam papers
They contain exam questions from up until the ***Summer 2023*** exam series
More recent exam papers do exist but are withheld for mock exams
As new exam papers are released these worksheets will gradually be updated
The ***most current*** version of these worksheets will always be available at: kennethstafford.co.uk

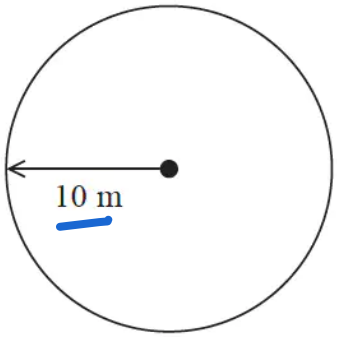
Question	Where the question appeared
1	Edexcel, GCSE, Summer 2017, Paper 1F, Q18
2	Edexcel, GCSE, Autumn 2017, Paper 1F, Q16
3	Edexcel, GCSE, Autumn 2017, Paper 1F, Q20
4	Edexcel, GCSE, Summer 2018, Paper 1F, Q22
5	Edexcel, GCSE, Autumn 2018, Paper 1F, Q24
6	Edexcel, GCSE, Summer 2019, Paper 3F, Q11
7	Edexcel, GCSE, Autumn 2020, Paper 1F, Q18
8	Edexcel, GCSE, Summer 2023, Paper 1F, Q11
9	Edexcel, GCSE, Summer 2022, Paper 1F, Q15

1

Balena has a garden in the shape of a circle of radius 10 m.
He is going to cover the garden with grass seed to make a lawn.

Grass seed is sold in boxes.
Each box of grass seed will cover 46 m^2 of garden.

Balena wants to cover all the garden with grass seed.



(a) Work out an estimate for the number of boxes of grass seed Balena needs.
You must show your working.

Area of garden $= \pi \times 10^2 = 3 \times 100 = 300\,m^2$

Boxes $\approx 50\,m^2$

Boxes needed $= 300 \div 50 = 6$

6 boxes

(4)

(b) Is your estimate for part (a) an underestimate or an overestimate?
Give a reason for your answer.

Underestimate as garden is bigger than $300\,m^2$. Also the boxes cover less than $50\,m^2$ per box

(1)

(Total for Question 18 is 5 marks)

[Edexcel, GCSE, Summer 2017, Paper 1F, Q18]

2

Berenika wants to buy 35 T-shirts.

Each T-shirt costs £5.80
Berenika does the calculation $40 \times 6 = 240$ to estimate the cost of 35 T-shirts.

(a) Explain how Berenika's calculation shows the actual cost will be less than £240

Because she is buying less than 40 T-Shirts and the price is less than £6.

(1)

There is a special offer.

T-shirts £5.80 each. Buy 30 or more T-shirts. Get 10% off the total cost.

(b) Work out the actual cost of buying 35 T-shirts using the special offer.

$30 \times 5.80 = 3 \times 58 = £174$

10% of $174 = £17.40$

$174 - 17.40 = 156.6$

£ 156.60

(4)

(Total for Question 16 is 5 marks)

[Edexcel, GCSE, Autumn 2017, Paper 1F, Q16]

3

Ami and Josh use a calculator to work out $\dfrac{595}{4.08^2 + 5.3}$

Ami's answer is 27.1115
Josh's answer is 271.115

One of these answers is correct.

Use approximations to find out which answer is correct.

$$\frac{600}{4^2 + 5} = \frac{600}{16+5} = \frac{600}{21}$$

$$\approx \frac{600}{20} = 30$$

Ami is correct.

(Total for Question 20 is 3 marks)

[Edexcel, GCSE, Autumn 2017, Paper 1F, Q20]

4

A cycle race across America is 3069.25 miles in length.

Juan knows his average speed for his previous races is 15.12 miles per hour.
For the next race across America he will cycle for 8 hours per day.

(a) Estimate how many days Juan will take to complete the race.

15 miles = 1 hour

x8 ↓ ↓ x8

120 miles = 8 hours

$$\frac{3000}{120} = \frac{300}{12} = \frac{150}{6} = 25$$

25 days

(3)

Juan trains for the race.
The average speed he can cycle at increases.
It is now 16.27 miles per hour.

(b) How does this affect your answer to part (a)?

It will take less time. Fewer days.

(1)

(Total for Question 22 is 4 marks)

[Edexcel, GCSE, Summer 2018, Paper 1F, Q22]

5

A plane travels at a speed of 213 miles per hour.

(a) Work out an estimate for the number of seconds the plane takes to travel 1 mile.

213 mph ≈ 200 miles per hour

200 miles = 60 mins

20 miles = 6 mins

20 miles = 6 x 60 = 360 seconds

10 miles = 180 seconds

1 mile = 18 seconds

..... seconds

(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

Overestimate as I rounded the speed down. So it is actually faster so will take less than 18 seconds to travel a mile.

(1)

(Total for Question 24 is 4 marks)

[Edexcel, GCSE, Autumn 2018, Paper 1F, Q24]

6

The table shows the costs of sending a parcel by the Express service and by the Rapid service.

Type of service	Cost
Express	£15.25
Rapid	£35.38

Brendan has to send 12 parcels.
It will be cheaper to send the parcels by the Express service than by the Rapid service.

(a) How much cheaper?

With Calculator : Express = 15·25 × 12 = £183

Rapid = 35·38 × 12 = £424·56

424·56 − 183 = £241·56

(3)

Luke wants to send 21 parcels by the Express service.

He does the calculation $20 \times £15 = £300$ to estimate the cost.

(b) Explain why Luke's calculation shows the actual cost will be more than £300

He is actually sending 1 more parcel and the real price is greater than £15.

(1)

(Total for Question 11 is 4 marks)

[Edexcel, GCSE, Summer 2019, Paper 3F, Q11]

7

Work out an estimate for $\dfrac{790 \times 289}{49}$

$$\frac{790 \times 289}{49} \approx \frac{800 \times 300}{50}$$

$$= \frac{240000}{50} = \frac{24,000}{5} = \frac{48,000}{10}$$

4800

(Total for Question 18 is 3 marks)

[Edexcel, GCSE, Autumn 2020, Paper 1F, Q18]

8

A total of 700 tickets were on sale for a football match.

452 of the tickets were sold.

(a) How many tickets were **not** sold?

700 − 452 = 248

(2)

For a different football match,

297 tickets were sold for £9.50 each.
399 tickets were sold for £19.50 each.

(b) Work out an estimate for the total amount of money paid for these tickets.
You must show all your working.

300 × 10 = £3000

400 × 20 = £8000

£11,000

£ 11,000

(3)

(c) Is your answer to part (b) an underestimate or an overestimate?
Give a reason for your answer.

Overestimate.
All the numbers were rounded up.

(1)

(Total for Question 11 is 6 marks)

[Edexcel, GCSE, Summer 2023, Paper 1F, Q11]

9

(a) Work out an estimate for the value of 92×1.63
You must show all your working.

$90 \times 2 = 180$

.....

(2)

Given that

$$2.96 \times 3.2 = 9.472$$

(b) find the value of 29.6×32

947.2

.....

(1)

(Total for Question 15 is 3 marks)

[Edexcel, GCSE, Summer 2022, Paper 1F, Q15]