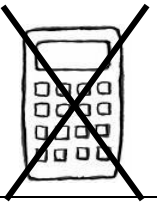
Name:	Teacher Assessment



Topic 25 - H
Approximations

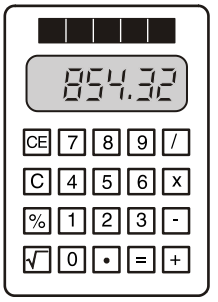
Section A — Rounding — Grade E → C

1. Write 15.2864 to 2 decimal places.

Answer .....

(Total 1 mark)

2. Pat works out the answer to 23.6 × 36.2 on a calculator.
Her answer is shown on the calculator.



(a) Round her answer to the nearest 10.

Answer ……

(1)

(b) Round her answer to the nearest 100.

Answer ……

(1)

(c) Round her answer to one decimal place.

Answer ……

(1)

(Total 3 marks)

3. Write 34.849 correct to 1 decimal place.

Answer .....

(Total 1 mark)

4. (a) (i) Write 86.3624 to 1 decimal place.

Answer .....

(1)

(ii) Write 86.3624 to 3 decimal places.

Answer .....

(1)

(c) Write 378 to 1 significant figure.

Answer .....

(1)

(Total 6 marks)

5. (a) Round to one significant figure

i.) 37.5 Answer .....

(1)

ii.) 34 320 Answer .....

(1)

iii.) 0.0851 Answer .....

(1)

(b) Round to two significant figures

i.) 18 320 Answer .....

(1)

ii.) 5.9641 Answer .....

(1)

(c) Round to three significant figures

i.) 740 923 Answer .....

(1)

ii.) 0.08029 Answer .....

(1)

(Total 7 marks)

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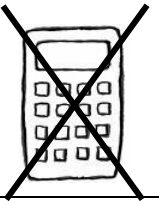

Section B Estimating Grade C

1. Estimate the value of $\dfrac{505.3 \times 1.9}{43.93 + 58.2}$

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Answer .....

(Total 2 marks)

2. Estimate the value of $\dfrac{59 \times 192}{29}$

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Answer .....

(Total 2 marks)

3. Find an approximate value of $\dfrac{48.8 \times 5.22}{(10.13)^2}$ You **must** show all your working.

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Answer .....

(Total 3 marks)

4. Hannah, Gemma and Jo use their calculators to work out the value of $\dfrac{28.78}{4.31 \times 0.47}$

Hannah gets 142.07, Gemma gets 14.207 and Jo gets 3.138

Use approximations to show which one of them is correct. You **must** show your working.

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Answer.....

(Total 3 marks)

5. Use approximations to show which of the following calculations gives the bigger answer.

(a) $59.4 \div 0.307$ (b) $80.16 \div 0.481$

You **must** show your working.

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Answer .....

(Total 3 marks)

6. Use approximations to estimate the value of $\frac{316 \times 4.03}{0.198}$ You **must** show your working.

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Answer .....

(Total 3 marks)

7. Use approximations to estimate the value of $\frac{8012}{48.61 \times 0.397}$

Success:

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Answer .....

(Total 3 marks)

8. Use approximations to estimate the value of $\sqrt{\frac{9.98}{0.203}}$ You **must** show your working.

Target:

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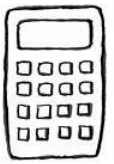
Answer .....

(Total 3 marks)

Teacher Assessment



Section C Upper and Lower Bounds Grade C

1. A bag of potatoes weighs 9 kg to the nearest kilogram.

Write down the least possible weight of the bag of potatoes.

Answer ..... kg

(Total 1 mark)

2. A cyclist records the distances she travels to the nearest mile.
One day her recorded distance is 28 miles.

Write down the least and greatest possible distance that she travelled.

Answer Least ..... miles

Greatest ..... miles

(Total 2 marks)

3. Garry runs a distance of 15 km, correct to the nearest km.

(a) Write down the minimum distance Garry could have run.

Answer .....km

(1)

(b) Write down the maximum distance Garry could have run.

Answer .....km

(1)
(Total 2 marks)

4. It takes 20 minutes to develop a roll of film.
This time is to the nearest minute.

What is the least and greatest time this could be?

Answer Least ..... minutes

Greatest ..... minutes

(Total 2 marks)

5. A sport pitch has a length of 75 metres, correct to the nearest metre.

Write down the least and the greatest possible length of this pitch.

Answer Least ..... metres

Greatest ..... metres

(Total 2 marks)

6. The scales at an airport weigh luggage to the nearest kilogram.
What are the greatest and least possible weights of a case showing 25 kg on the scale?

Answer Greatest ..... kg

Least .....kg

(Total 2 marks)

7. Mount Everest is 8848 m high to the nearest metre. What is its smallest possible height in kilometres?

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Answer ..... km

(Total 2 marks)

Be careful with the following questions, especially with the upper bounds.

8. There are 14 700 (to the nearest hundred) spectators at a football match.

(i) What is the least possible number of spectators?

Answer .....

(1)

(ii) What is the maximum number of spectators?

Answer .....

(1)

(Total 2 marks)

9. A college has 6300 students, correct to the nearest hundred.

(i) What is the least possible number of students in this college?

Answer .....

(1)

(ii) What is the greatest possible number of students in this college?

Answer .....

(1)

(Total 2 marks)

10. Kirsty buys a bag that costs £25 to the nearest pound.

(a) Write the least amount that she could have paid.

Answer £ …….

(1)

(b) Write the greatest amount that she could have paid.

Answer £ …….

(1)
(Total 2 marks)

11. Sophie spends £8 on a picture.
This amount is given correct to the nearest pound.

Write down

(a) the maximum price which Sophie could have paid,

Answer £ .....

(1)

(b) the minimum price which Sophie could have paid.

Answer £ .....

(1)
(Total 2 marks)

Be careful with this final question, think carefully about both lower and upper bounds.

12. This is a true statement.

Kylie

Write down

(a) the minimum age that Kylie could be,

Answer .....

(1)

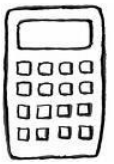
(b) the maximum age that Kylie could be.

Answer .....

(1)
(Total 2 marks)

Success:	Target:

Teacher Assessment



Section D Problem Solving Using Bounds Grade B → A*

1. A book weighs 3.2 kg, given to the nearest 100 g.

Find the minimum possible weight of 6 copies of the same book.

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Answer ..... kg

(Total 2 marks)

2. Mark's height is 203 cm and Eileen's height is 185 cm.
Both heights are given to the nearest cm.

Find the maximum possible difference between the two heights.

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Answer ..... cm

(Total 2 marks)

3. A can of drink weighs 342 g to the nearest gram.

(a) What are the minimum and maximum weights of the can?

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Answer Minimum weight ..... g

Maximum weight ..... g

(2)

(b) The cans are sold in packs of 12
What are the minimum and maximum weights of a pack of cans?

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Answer Minimum weight ..... g

Maximum weight ..... g

(2)(Total 4 marks)

4. Nut toffees weigh 9 grams each, correct to the nearest gram,

(a) What is the minimum possible weight of 10 nut toffees?

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Answer .....grams

(2)

(b) Treacle toffees weigh 8 grams each, correct to the nearest gram.
10 nut toffees and 10 treacle toffees are put into a bag.
The manufacturer says, "This bag contains at least 162 grams of toffees."

Is this correct? Explain your answer carefully.

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(2)
(Total 4 marks)

5. A boy runs 50 metres at a speed of 5 m/s.
Both values are measured to an accuracy of one significant figure.
What is the least possible time taken?

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Answer ..... seconds

(Total 3 marks)

6. (a) The numbers in this calculation are given to 3 significant figures.

Find the least possible value of $\frac{12.3}{15.6 - 7.20}$

You **must** show all your working.

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Answer .....

(3)

(b) The maximum safe load of a lift is 1500 kg, to the nearest 50 kg.
The lift is loaded with boxes weighing 141 kg and 150 kg, both weights given to the nearest kilogram.

Can the lift safely carry 3 boxes weighing 141 kg each and 7 boxes weighing 150 kg each?

You **must** show all your working.

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(3)

(Total 6 marks)

7. (a) Find the greatest possible value of $\dfrac{12.3(18.5+9.41)}{15.8}$

All the numbers are given correct to three significant figures.
Write down your full calculator display.

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Answer .....

(3)

(b) A trailer can safely carry weights up to 5200 kg, correct to two significant figures. It is loaded with boxes weighing 115 kg, correct to the nearest kilogram.

Calculate the greatest number of boxes that the trailer can carry safely.
You **must** show all your working.

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Answer .....

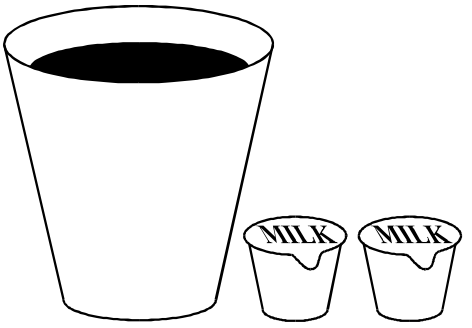
(3)
(Total 6 marks)

8. A coffee machine dispenses 130 millilitres of black coffee into cups with a capacity of 175 millilitres.
These values are accurate to 3 significant figures.

Milk is supplied in small cartons which contain 21 millilitres, accurate to the nearest millilitre.

Beryl likes milky coffee and always puts 2 cartons of milk in her coffee.

Will Beryl's cup ever overflow?



You **must** show all your working.

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(Total 4 marks)

9. A lift cable can safely carry a total load 1200 kg.
The lift weighs 280 kg.
Both numbers are given to two significant figures.
The total load is made up of the weight of the lift and its contents.
The lift carries boxes weighing 65 kg each, correct to the nearest kg.

How many boxes can safely be carried?
You must show all your working.

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Answer .....

(Total 4 marks)

10. A floodlight tower is marked with the following sign.

WATTAGE NOT TO EXCEED
400 000 WATTS

The spotlights on the tower are rated at 2500 watts each.
The manufacturer can only guarantee that the wattage of these spotlights is accurate to the nearest 100 watts.

(a) What is the maximum number of spotlights that can **safely** be put on the tower?

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Answer .....

(3)

(b) The formula $W = I^2 R$

connects W (watts), I (amps) and R (ohms).

For one of the spotlights, the value of I is 25 amps measured to 2 significant figures.

What is the minimum possible value of R?

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Answer ..... ohms

(3)
(Total 6 marks)

Success:	Target: