1(a).

By rounding each value to **one** significant figure, estimate the cost of 5.8 kg of carrots at 82p per kg.

£ ..... **[2]**

(b). A student works out an estimate for this calculation.

$$\frac{14.2+1.14}{4.924}$$

Their method is to:

- round each number correct to the same number of significant figures and
- work out the approximation.

The student writes

$$\frac{14+1}{5}=\frac{15}{5}=3$$

.

What error has the student made in using their method?

---**[1]**

2. The width, *w*, of a car parking space is 3.2 metres, correct to **1** decimal place.

Complete the error interval for the width, *w*.

..... ≤ *w* < .....**[2]**

3. The circumference of a circle is 21 cm.

Calculate the diameter of the circle.
Give your answer correct to **1** decimal place.

..... cm **[3]**

4. Calculate

$$\sqrt{\frac{14.2^3 - 92}{6^2}}$$

Give your answer correct to **3** significant figures.

..... **[3]**

5(a). The table shows how much Ivan earns per hour.

Work done on Monday to Friday	£20.23 per hour
Work done on Saturday or Sunday	£30.18 per hour

One week Ivan works for $30\frac{1}{4}$ hours between Monday and Friday and then for $5\frac{1}{3}$ hours on Saturday.

Ivan says

I will earn at least £700 for my work this week.

By rounding each value to the nearest integer, use estimation to show that Ivan may be correct.

[5]

(b). Give **one** reason why your working in part **(a)** shows that Ivan can be **certain** of earning at least £700 for his work in this week.

---**[1]**

6. A number, *n*, is given as 3.8, truncated to 1 decimal place.

Complete the error interval for *n* using a number and a symbol.

..... ≤ *n* ..... 3.9 **[2]**

7. Work out $\frac{2}{3}$ of 112.
Give your answer correct to **1** decimal place.

..... **[3]**

8. Kofi buys some keyrings.
Each keyring costs £1.39.
Kofi pays with a £20 note and buys the largest number of keyrings possible.

How much change should Kofi receive?

..... p **[4]**

9(a). Compost is used to grow plants.
Jane has a sack containing 60 litres of compost.
She uses this compost to fill pots for her plants.

Jane fills ten large pots each holding 5.5 litres.

Work out how much compost is left in the sack.

..... litres **[2]**

(b). Jane uses the remaining compost to fill small pots each holding 800 ml.

Work out the maximum number of small pots Jane can fill with the remaining compost.

..... **[3]**

(c). Work out how much compost will then be left in the sack.

..... ml **[2]**

10. A garage is 6 metres long, correct to the nearest metre.
A van is 5.5 metres long, correct to 1 decimal place.

Show that the van may **not** fit in the garage.

[3]

11. Sam eats 40% of a 600 g pack of cereal every day.

Sam has no cereal left.
The cereal is no longer sold in 600 g packs.
Instead, the cereal is now sold in 400 g packs.

Sam wants to continue to eat the same amount of cereal every day.

Work out the **minimum** number of 400 g packs of cereal that Sam must buy to have enough for 7 days.
You must show your working.

..... 400 g packs **[5]**

12(a). By rounding each value to **one** significant figure, estimate the cost of 4.9 kg of carrots at 73p per kg.

£ ..... **[2]**

(b). A student works out an estimate for this calculation.

$$\frac{13.7 + 1.28}{5.099}$$

Their method is to:

- round each number correct to the same number of significant figures and
- work out the approximation.

The student writes

$$\frac{14 + 1}{5} = \frac{15}{5} = 3.$$

What error has the student made in using their method?

_____ **[1]**

13. The width, *w*, of a car parking space is 2.8 metres, correct to 1 decimal place.

Complete the error interval for the width, *w*.

..... ≤ w < ..... **[2]**

14. The circumference of a circle is 17cm.

Calculate the diameter of the circle.
Give your answer correct to **1** decimal place.

..... cm **[3]**

15. Calculate

$$\sqrt{\frac{12.9^2 + 83}{5^2}}$$

Give your answer correct to **3** significant figures.

..... **[3]**

16(a). A number, *r*, is 4.3 when rounded correct to 2 significant figures.
A number, *h*, is 4.3 when truncated to 1 decimal place.

Write down a possible value of *r* that will definitely be less than all possible values of *h*.

r = ... **[1]**

(b). Write down a possible value of h that will definitely be greater than all possible values of r.

h = ... **[1]**

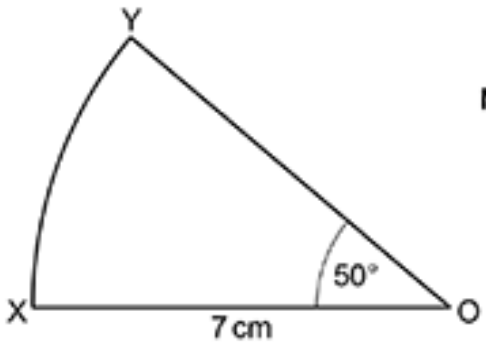
(c). Write down a possible value of r and a possible value of h such that r is greater than h.

r = ... and h =..... **[1]**

17. By rounding each value to **one** significant figure, estimate the cost of 7.3 kg of potatoes at 62p per kg.
Give your answer in pounds.

£ ..... **[3]**

18. XOY is a sector of a circle, centre O.



Show that the area of the sector is 21.4 cm^2, correct to **3** significant figures.

[3]

19(a). Round £5.4685 to the **nearest penny**.

£…….…….…….. **[1]**

(b). Round 5749 to the **nearest hundred**.

…….…….…….. **[1]**

20. A number, *n*, is given as 2.6, truncated to 1 decimal place.

Complete the error interval for *n* using a number and a symbol.

..... ≤ *n* ..... 2.7 **[2]**

21. Work out $\frac{2}{3}$ of 103.

Give your answer correct to **1** decimal place.

..... **[3]**

22. Kai buys some keyrings.
Each keyring costs £1.19.
Kai pays with a £20 note and buys the largest number of keyrings possible.

How much change should Kai receive?

..... p **[4]**

23(a). Compost is used to grow plants.
Ivan has a sack containing 50 litres of compost.
He uses this compost to fill pots for his plants.

Ivan fills six large pots each holding 7.5 litres.

Work out how much compost is left in the sack.

..... litres **[2]**

(b). Ivan uses the remaining compost to fill small pots each holding 400 ml.

Work out the maximum number of small pots Ivan can fill with the remaining compost.

..... **[3]**

(c). Work out how much compost will then be left in the sack.

..... ml **[2]**

24(a). The table shows how much Amaya earns per hour.

Work done on Monday to Friday	£20.15 per hour
Work done on Saturday or Sunday	£30.23 per hour

One week Amaya works for $40\frac{1}{3}$ hours between Monday and Friday and then for $4\frac{1}{4}$ hours on Saturday.

Amaya says

I will earn at least £900 for my work this week.

By rounding each value to the nearest integer, use estimation to show that Amaya may be correct.

[5]

(b). Give **one** reason why your working in part **(a)** shows that Amaya can be **certain** of earning at least £900 for her work in this week.

---

[1]

25. Sam eats 30% of a 600 g pack of cereal every day.

Sam has no cereal left.
The cereal is no longer sold in 600 g packs.
Instead, the cereal is now sold in 400 g packs.

Sam wants to continue to eat the same amount of cereal every day.

Work out the **minimum** number of 400 g packs of cereal that Sam must buy to have enough for 7 days.
You must show your working.

..... 400 g packs **[5]**

26. A garage is 5 metres long, correct to the nearest metre.
A car is 4.5 metres long, correct to 1 decimal place.

Show that the car may **not** fit in the garage.

[3]

27(a). Harper works out 57.8 × 4.2 on a calculator.
Harper's answer is 2427.6.

Do you think Harper has used their calculator correctly?
Explain why.

_____ because _____

_____ **[1]**

(b). By writing each number correct to **1** significant figure, find an estimate for 57.8 × 4.2.

…….…….…….. **[2]**

28. Sam makes 16 cakes.
Each cake needs a piece of ribbon 17 cm long for decoration.

Ribbon is only sold in rolls of 1.1 metres, which can then be cut into 17 cm pieces.
One roll of ribbon costs 84p.

Calculate the cost of the ribbon that Sam must buy to decorate the 16 cakes.
You must show your working.

£ …….…….…….. **[4]**

29(a). The number of people watching a football match is 34 000, correct to the nearest thousand.

Complete the error interval for n, the number of people watching the football match.

……. ≤ n < 34 500 **[1]**

(b). The number of people watching a rugby match is 34 500, correct to the nearest hundred.

Show that fewer people could be watching the rugby match than the football match.

[2]

30(a). Three friends are going on holiday together.
They each take a suitcase.
The weight of each suitcase is 22 kg, correct to nearest kilogram.

Complete the error interval for the weight, *w* kg, of **one** suitcase.

…….…….. ≤ *w* < ……..…….. **[2]**

(b). The friends must pay extra if the total weight of their three suitcases is more than 67.3 kg.

Can the friends be certain that they will **not** have to pay extra?
Show how you decide.

_____ because _____

_____

_____ **[3]**

31. Jane has these three number tiles.

Write down the three-digit number closest to 500 that can be made using all three of Jane's tiles.

…….…….…….. **[1]**

32. Ling has some empty boxes.
Each box can hold 57 pencils.
Ling has 350 pencils.

Ling says that six boxes are needed to hold all of the pencils.

Is Ling correct?
You must show your working.

_____ because _____

_____ **[2]**

33. Taylor invests £8000 at a rate of 0.9% per year compound interest.

Calculate the total amount of **interest** Taylor will have earned after 6 years.
Give your answer correct to the **nearest penny**.

£ …….…….…… **[4]**

34(a). Round 456 to the **nearest ten**.

…….…….…… **[1]**

(b). Round 749 438 to **3** significant figures.

..... **[1]**

35. A carpenter measures the length, k metres, of a piece of wood.

They write

$2.45 \leq k < 2.55$.

The carpenter says

$2.45 \leq k < 2.55$ means that the length of the piece of wood is 2.5 metres correct to the nearest centimetre.

i. Explain how you know that she is incorrect.

---**[1]**

ii. Complete the interval for 2.5m, correct to the nearest centimetre.

$2.495 \leq k <$ ..... **[1]**

36. Rowan has 40 m of ribbon.
They cut the ribbon into lengths of 70 cm.

What is the least length of ribbon, in cm, that can be left over?
You must show your working.

..... cm **[5]**

37. A carpenter measures the length, k metres, of a piece of wood.

They write

$2.45 \leq k < 2.55$.

Put rings around all possible values of k in the list below.

2.54 2.449 2.49 2.55 2.65

[2]

38(a). A number, r, is 6.2 when rounded correct to 2 significant figures.
A number, h, is 6.2 when truncated to 1 decimal place.

Write down a possible value of r that will definitely be less than all possible values of h.

r = ... **[1]**

(b). Write down a possible value of h that will definitely be greater than all possible values of r.

h = ... **[1]**

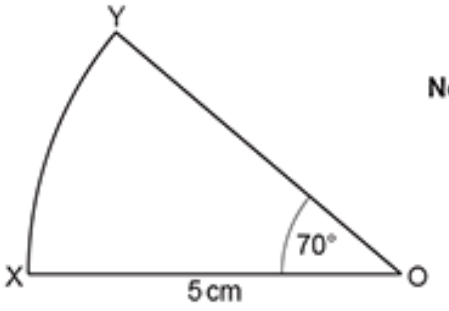
(c). Write down a possible value of r and a possible value of h such that r is greater than h.

r = ... and h =..... **[1]**

39. By rounding each value to **one** significant figure, estimate the cost of 8.2 kg of bananas at 73p per kg.
Give your answer in pounds.

£ ..... **[3]**

40. XOY is a sector of a circle, centre O.



Show that the area of the sector is 15.3 cm^2, correct to **3** significant figures.

[3]

41(a). Round 3648 to the **nearest hundred**.

..... **[1]**

(b). Round £3.2875 to the **nearest penny**.

£ ..... **[1]**

42(a). The number of people watching a football match is 30 000, correct to the nearest thousand.

Complete the error interval for n, the number of people watching the football match.

..... ≤ *n* < 30 500 **[1]**

(b). The number of people watching a rugby match is 30 500, correct to the nearest hundred.

Show that fewer people could be watching the rugby match than the football match.

[2]

43(a).

By writing each number correct to **1** significant figure, find an estimate for 79.8 × 3.1.

..... **[2]**

(b). Jamie works out 79.8 × 3.1 on a calculator.
Jamie's answer is 2473.8.

Do you think Jamie has used their calculator correctly?
Explain why.

_____ because _____

_____ **[1]**

44. Morgan makes 15 cakes.
Each cake needs a piece of ribbon 18 cm long for decoration.

Ribbon is only sold in rolls of 1.2 metres, which can then be cut into 18 cm pieces.
One roll of ribbon costs 92p.

Calculate the cost of the ribbon that Morgan must buy to decorate the 15 cakes.
You must show your working.

£ ..... **[4]**

45(a). Four friends are going on holiday together.
They each take a suitcase.
The weight of each suitcase is 25 kg, correct to nearest kilogram.

Complete the error interval for the weight, *w* kg, of **one** suitcase.

(a) ..... ≤ w < ..... **[2]**

(b). The friends must pay extra if the total weight of their four suitcases is more than 102.4 kg.
Can the friends be certain that they will **not** have to pay extra?

Show how you decide.

_____ because _____

_____

[3]

46. Jamie has some empty boxes.
Each box can hold 73 pencils.
Jamie has 590 pencils.

Jamie says that eight boxes are needed to hold all of the pencils.

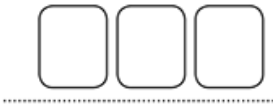
Is Jamie correct?
You must show your working.

_____ because _____

[2]

47. Ashley has these three number tiles.

Write down the three-digit number closest to 300 that can be made using all three of Ashley's tiles.



[1]

48(a). A carpenter measures the length, k metres, of a piece of wood.

They write

$3.35 \leqslant k < 3.45.$

Put rings around all possible values of k in the list below.

3.349 3.39 3.44 3.45 3.55

[2]

(b). The carpenter says

$3.35 \leqslant k < 3.45$ means that the length of the piece of wood is 3.4 metres correct to the nearest centimetre.

i. Explain how you know that she is incorrect.

---

[1]

ii. Complete the interval for 3.4 m, correct to the nearest centimetre.

$3.395 \leqslant k <$ ..... **[1]**

49. Ellis has 28 m of ribbon.
They cut the ribbon into lengths of 60 cm.

What is the least length of ribbon, in cm, that can be left over?
You must show your working.

..... cm **[5]**

50. This table shows the names and areas of five lakes.

Name of Lake	Area in km^2
Ladoga	1.81×10^4
Mweru	5.12×10^3
Tana	3.20×10^3
Topozero	9.86×10^2
Victoria	6.89×10^4

Calculate the difference between the areas of Lake Ladoga and Lake Tana.
Give your answer in standard form, correct to **2** significant figures.

..... km^2 **[4]**

51. Charlie invests £9000 at a rate of 0.7% per year compound interest.

Calculate the total amount of **interest** Charlie will have earned after 5 years.
Give your answer correct to the **nearest penny**.

£ ..... **[4]**

52(a). Round 564 to the **nearest ten**.

..... **[1]**

(b). Round 438 749 to **3** significant figures.

..... **[1]**

53. Force is measured in newtons (N).
A force of 198.5 N is applied to a rectangular surface of length 4.9 cm and width 4.1 cm.

Work out an estimate of the pressure, in N / cm^2, applied to this rectangular surface.

[The formula for pressure is: $\text{Pressure} = \frac{\text{Force}}{\text{Area}}$]

..... N / cm^2 **[4]**

END OF QUESTION PAPER