

THT WORKSHEETS

Learn With the Solutions

NAPLAN Preparation

Year 5 Numeracy

Number, Measurement & Mathematical Reasoning

These solutions explain the reasoning behind each answer. Students should compare their method with the worked solution, identify where any mistake occurred, and then attempt the question again independently.

1.

Understanding the Question

The question asks for both an **estimate** and an **exact answer**.

An estimate helps us decide whether the exact calculation is reasonable.

The calculation is:

$$396 + 608$$

Estimate

Round each number to the nearest hundred:

$$396 \approx 400$$

$$608 \approx 600$$

Now add:

$$400 + 600 = 1,000$$

Exact calculation

$$396 + 608$$

One efficient method is to compensate:

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$$396 + 600 = 996$$

$$996 + 8 = 1,004$$

Compare the estimate and exact answer

$$\text{Exact answer} = 1,004$$

$$\text{Estimate} = 1,000$$

The estimate is:

$$1,004 - 1,000 = 4$$

less than the exact answer.

Final Answer

Estimate: **1,000**

Exact answer: **1,004**

The estimate is an **underestimate**.

NAPLAN Tip

Estimating first gives you a quick way to check your exact answer. An answer such as 10,004 would clearly be unreasonable.

2.

Understanding the Question

Each tray holds 18 muffins.

The school needs space for all 145 muffins, so we must find how many groups of 18 are required.

Divide the muffins into trays

$$145 \div 18$$

$$18 \times 8 = 144$$

This means 8 trays can hold 144 muffins.

However, the school has 145 muffins, so one muffin still needs a space.

Therefore, one additional tray is required.

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a) Number of trays

8 full trays are not enough.

$$8 + 1 = 9$$

Final Answer: 9 trays

b) Empty spaces in the final tray

The first 8 trays hold:

$$8 \times 18 = 144 \text{ muffins}$$

There is only:

$$145 - 144 = 1 \text{ muffin}$$

in the ninth tray.

The ninth tray has 18 spaces, so the number of empty spaces is:

$$18 - 1 = 17$$

Final Answer: 17 empty spaces

Common Mistake

Do not write 8 trays just because $145 \div 18$ gives 8 remainder 1. The remaining muffin still requires another tray.

3.

Understanding the Question

We need to find three-quarters of 32 students.

The fraction $\frac{3}{4}$ means:

- divide the total into 4 equal parts;
- take 3 of those parts.

Step 1: Find one quarter

$$32 \div 4 = 8$$

One quarter of the class is 8 students.

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Step 2: Find three quarters

$$8 \times 3 = 24$$

Final Answer: 24 students

Alternative Method

$$32 \times \frac{3}{4}$$

$$= 32 \div 4 \times 3$$

$$= 8 \times 3$$

$$= 24$$

Quick Check

One-half of 32 is 16. Three-quarters must be more than 16 but less than 32, so 24 is reasonable.

4.

Understanding the Question

The movie begins at 6:45 pm and lasts for 1 hour 35 minutes.

It is often easier to add the hours and minutes separately.

Add one hour

$$6:45 \text{ pm} + 1 \text{ hour} = 7:45 \text{ pm}$$

Add 35 minutes

From 7:45 pm to 8:00 pm is 15 minutes.

There are still:

$$35 - 15 = 20 \text{ minutes}$$

to add.

$$8:00 \text{ pm} + 20 \text{ minutes} = 8:20 \text{ pm}$$

Final Answer: 8:20 pm

Common Mistake

There are 60 minutes in an hour, not 100. Do not write 7:80 pm.

5.

Understanding the Question

The width stays the same, but the length increases by 6 cm.

We must first find the new length and then calculate the new area.

Original length = 24 cm

Width = 15 cm

Step 1: Find the new length

$$24 + 6 = 30 \text{ cm}$$

Step 2: Calculate the new area

Area of a rectangle:

$$\text{Area} = \text{length} \times \text{width}$$

$$\text{Area} = 30 \times 15$$

Break 15 into 10 and 5:

$$30 \times 10 = 300$$

$$30 \times 5 = 150$$

$$300 + 150 = 450$$

Final Answer: 450 cm²

Common Mistake

Do not add 6 cm to both dimensions. Only the length changes.

6.

Understanding the Question

The offer is:

Buy 3 pairs and receive the 4th pair free.

This means that for every group of 4 pairs, the customer pays for only 3.

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The customer buys 12 pairs.

Step 1: Find the number of groups

$$12 \div 4 = 3 \text{ groups}$$

Step 2: Find the cost of one group

The customer pays for 3 pairs in each group.

$$3 \times \$8 = \$24$$

Step 3: Find the total cost

$$3 \text{ groups} \times \$24$$

$$= \$72$$

Final Answer: \$72

Faster Method

Out of 12 pairs:

- 9 pairs are paid for;
- 3 pairs are free.

$$9 \times \$8 = \$72$$

NAPLAN Tip

When a special offer repeats, first group the items according to the wording of the offer.

7.

Understanding the Question

The tank starts with 1,250 L.

Each day, 175 L is used for 5 days.

We first calculate the total amount used, then subtract it from the starting amount.

Step 1: Calculate the water used

$$175 \times 5$$

$$= 875 \text{ L}$$

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Step 2: Subtract from the starting amount

$$1,250 - 875$$

One method is:

$$1,250 - 800 = 450$$

$$450 - 75 = 375$$

Final Answer: 375 L

Check

$$875 + 375 = 1,250$$

The calculation is correct.

8.

Understanding the Question

Each book earns 3 reading points.

We can either:

- add all the books first and multiply by 3; or
- multiply each class total by 3 and then add.

Adding the books first is more efficient.

Step 1: Find the total number of books

$$68 + 74 + 81 + 77$$

Pair convenient numbers:

$$68 + 81 = 149$$

$$74 + 77 = 151$$

$$149 + 151 = 300$$

Step 2: Calculate the reading points

$$300 \times 3 = 900$$

Final Answer: 900 reading points

Quick Tip

Look for pairs that make friendly totals. Here, the four class totals add neatly to 300.

9.

Understanding the Question

The first square has a perimeter of 48 cm.

The second square has a perimeter 12 cm greater.

We must find the second square's side length before calculating its area.

Step 1: Find the second perimeter

$$48 + 12 = 60 \text{ cm}$$

Step 2: Find the side length

A square has four equal sides.

Side length:

$$60 \div 4 = 15 \text{ cm}$$

Step 3: Find the area

Area of a square:

$$\text{Area} = \text{side} \times \text{side}$$

$$\text{Area} = 15 \times 15$$

$$= 225 \text{ cm}^2$$

Final Answer: 225 cm²

Common Mistake

Do not add 12 cm directly to the original side length. The 12 cm increase applies to the whole perimeter.

10.

Understanding the Question

The family earns \$580 per week.

We need to:

- a) add the listed expenses and subtract them from the income;
- b) calculate 40% of the remaining money.

Step 1: Add the expenses

Groceries = \$215

Fuel = \$84

Electricity = \$97

Internet = \$39

Total:

$$215 + 84 + 97 + 39$$

Pair convenient values:

$$215 + 84 = 299$$

$$97 + 39 = 136$$

$$299 + 136 = 435$$

Total expenses = \$435

a) Money remaining

$$580 - 435 = 145$$

Final Answer: \$145 remains

b) Amount saved

The family saves 40% of \$145.

$$40\% = 0.40$$

$$145 \times 0.40$$

$$= 58$$

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Final Answer: \$58 is saved

Alternative Method

$$10\% \text{ of } \$145 = \$14.50$$

$$40\% = 4 \times 10\%$$

$$4 \times \$14.50 = \$58$$

11.

Understanding the Question

The ribbon length is given in metres, but each piece is measured in centimetres.

We must use the same unit before dividing.

Step 1: Convert metres to centimetres

$$1 \text{ m} = 100 \text{ cm}$$

$$9 \text{ m} = 900 \text{ cm}$$

Step 2: Divide into 40 cm pieces

$$900 \div 40$$

$$40 \times 22 = 880$$

So 22 complete pieces can be cut.

Step 3: Find the remaining ribbon

$$900 - 880 = 20 \text{ cm}$$

Final Answer

22 complete pieces

20 cm remaining

Common Mistake

Do not calculate $9 \div 40$. The units must first be converted so that both measurements are in centimetres.

12.

Understanding the Question

The cyclist travels at 24 km/h for 2 hours 30 minutes.

We need to express the time in hours.

30 minutes is half an hour.

Therefore:

2 hours 30 minutes = 2.5 hours

Use the distance formula

Distance = speed $\times$ time

Distance = 24×2.5

One method is:

$$24 \times 2 = 48$$

$$24 \times 0.5 = 12$$

$$48 + 12 = 60$$

Final Answer: 60 km

Quick Check

In 2 hours, the cyclist travels 48 km. In another half hour, she travels 12 km. The total of 60 km is reasonable.

13.

Understanding the Question

We need to compare two combined groups:

- Swimming or Soccer
- Basketball or Tennis

Step 1: Add Swimming and Soccer

Swimming = 18

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Soccer = 16

$$18 + 16 = 34$$

Step 2: Add Basketball and Tennis

Basketball = 13

Tennis = 9

$$13 + 9 = 22$$

Step 3: Find the difference

$$34 - 22 = 12$$

Final Answer: 12 more students

Common Mistake

The word “or” means combine the two categories. Do not compare only Swimming with Basketball.

14.

Understanding the Question

The number must satisfy all three clues:

- between 600 and 700;
- divisible by 5;
- divisible by 9.

A number divisible by 5 must end in 0 or 5.

A number divisible by 9 must have a digit sum that is a multiple of 9.

Check numbers ending in 0

Possible numbers include:

600, 610, 620, 630, 640, 650, 660, 670, 680, 690

Check digit sums:

630:

$$6 + 3 + 0 = 9$$

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So 630 is divisible by 9.

No other number ending in 0 has a digit sum of 9 or 18.

Check numbers ending in 5

Possible numbers include:

605, 615, 625, 635, 645, 655, 665, 675, 685, 695

Check 675:

$$6 + 7 + 5 = 18$$

18 is divisible by 9.

So 675 works.

Confirm the answers

$$630 \div 5 = 126$$

$$630 \div 9 = 70$$

$$675 \div 5 = 135$$

$$675 \div 9 = 75$$

Final Answer: 630 and 675

Common Mistake

The question asks for all possible numbers. Continue checking after finding the first valid answer.

15.

Understanding the Question

Each pack contains 32 exercise books.

There are 915 students, and every student needs one book.

We must buy enough complete packs to provide at least 915 books.

Step 1: Divide

$$915 \div 32$$

$$32 \times 28 = 896$$

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This is not enough because:

$$915 - 896 = 19 \text{ students}$$

would have no book.

Therefore, one more pack is needed.

a) Number of packs

$$28 + 1 = 29$$

Final Answer: 29 packs

b) Books left over

$$29 \times 32$$

$$= 928 \text{ books}$$

Books left over:

$$928 - 915 = 13$$

Final Answer: 13 books left over

NAPLAN Tip

When items are sold only in complete packs, always ask whether the quotient must be rounded up.

16.

Understanding the Question

The map scale is:

$$1 \text{ cm} : 250 \text{ m}$$

The distance on the map is 9.2 cm.

Step 1: Find the actual distance in metres

$$9.2 \times 250$$

Break 250 into $1,000 \div 4$:

$$9.2 \times 1,000 = 9,200$$

$$9,200 \div 4 = 2,300$$

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Actual distance = 2,300 m

Step 2: Convert metres to kilometres

1,000 m = 1 km

2,300 m = 2.3 km

Final Answer: 2.3 km

Common Mistake

Do not report 2,300 km. The first calculation gives metres because the scale uses metres.

17.

Understanding the Question

Emma wants to buy 2 lunch boxes.

We need to calculate the total cost under both offers and compare them.

Regular price of one lunch box = \$45

Option A: 20% off

Find 20% of \$45:

$$45 \times 0.20 = 9$$

Discounted price of one lunch box:

$$45 - 9 = 36$$

Cost of two lunch boxes:

$$2 \times 36 = 72$$

Option A total: \$72

Option B

Two lunch boxes cost:

\$76

Compare

Option A = \$72

THT.

Option B = \$76

Difference:

$$76 - 72 = 4$$

Final Answer: Option A is cheaper by \$4.

Faster Method

20% off means paying 80%.

Two lunch boxes normally cost:

$$2 \times \$45 = \$90$$

80% of \$90:

$$90 \times 0.80 = \$72$$

18.

Understanding the Question

We need to find:

- a) the mean;
- b) the range.

Temperatures:

17°C, 21°C, 20°C, 23°C, 19°C

a) Mean temperature

Add the values:

$$17 + 21 + 20 + 23 + 19$$

Pair convenient values:

$$17 + 23 = 40$$

$$21 + 19 = 40$$

$$40 + 40 + 20 = 100$$

There are 5 temperatures.

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Mean:

$$100 \div 5 = 20$$

Final Answer: 20°C

b) Range

Range = highest value – lowest value

$$\text{Highest} = 23^{\circ}\text{C}$$

$$\text{Lowest} = 17^{\circ}\text{C}$$

$$23 - 17 = 6$$

Final Answer: 6°C

Common Mistake

The range is not the difference between the first and last values listed. Use the highest and lowest values.

19.

Understanding the Question

The builder must use all 180 tiles to form a rectangle.

The dimensions must therefore be factor pairs of 180.

Possible factor pairs include:

$$1 \times 180$$

$$2 \times 90$$

$$3 \times 60$$

$$4 \times 45$$

$$5 \times 36$$

$$6 \times 30$$

$$9 \times 20$$

$$10 \times 18$$

THT.

$$12 \times 15$$

Any two different valid arrangements may be used.

Example Arrangement 1

$$10 \times 18$$

Perimeter:

$$2 \times (10 + 18)$$

$$= 2 \times 28$$

$$= 56 \text{ units}$$

Example Arrangement 2

$$12 \times 15$$

Perimeter:

$$2 \times (12 + 15)$$

$$= 2 \times 27$$

$$= 54 \text{ units}$$

Compare

$$56 > 54$$

Therefore, the 10×18 rectangle has the greater perimeter.

Final Answer

Example arrangements:

$$10 \times 18 \text{ and } 12 \times 15$$

The 10×18 rectangle has the greater perimeter.

Key Idea

For rectangles with the same area, dimensions that are farther apart usually produce a larger perimeter.

Marking Note

Other correct factor pairs and comparisons are acceptable.

20.

Understanding the Question

Sophie says:

“Every number that is divisible by 12 must also be divisible by 3 and by 4.”

We need to decide whether the statement is correct.

Examine the factors of 12

$$12 = 3 \times 4$$

Any whole number divisible by 12 can be written as:

$$12 \times \text{another whole number}$$

For example:

$$24 = 12 \times 2$$

$$24 \div 3 = 8$$

$$24 \div 4 = 6$$

Another example:

$$60 = 12 \times 5$$

$$60 \div 3 = 20$$

$$60 \div 4 = 15$$

Both examples are divisible by 3 and 4.

Because 3 and 4 are factors of 12, every multiple of 12 is also a multiple of 3 and 4.

Final Answer: Sophie is correct.

The statement is **always true**.

Common Mistake

The reverse statement is not automatically true unless a number is divisible by both 3 and 4. A number divisible by only one of them may not be divisible by 12.

Quick Answer Check

1. Estimate: 1,000
Exact answer: 1,004
Underestimate
2. a) 9 trays
b) 17 empty spaces
3. 24 students
4. 8:20 pm
5. 450 cm²
6. \$72
7. 375 L
8. 900 reading points
9. 225 cm²
10. a) \$145
b) \$58
11. 22 complete pieces; 20 cm remaining
12. 60 km
13. 12 students
14. 630 and 675
15. a) 29 packs
b) 13 books left over
16. 2.3 km
17. Option A; cheaper by \$4
18. a) 20°C
b) 6°C
19. Any two valid factor-pair rectangles; for example, 10×18 has a greater perimeter than 12×15 .
20. Sophie is correct; the statement is always true.