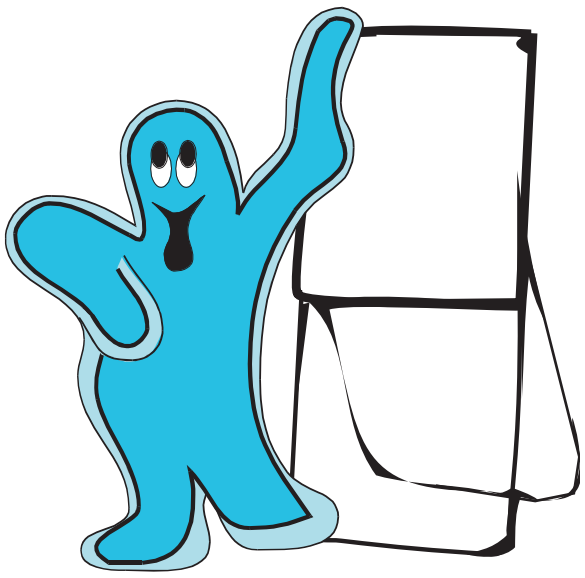
Mathematics Homework Book

Level 5

Robert Lakeland & Carl Nugent



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Fractions (Adding and Subtracting) – Solve number problems involving fractions.

Examples

a) Calculate $\frac{2}{3}+\frac{3}{4}$

b) Calculate $\frac{5}{9}-\frac{2}{7}$

On a calculator we enter

a) [2] [a b/c] [3] [+] [3] [a b/c] [4] [=]

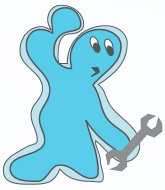
which gives $= 1\frac{5}{12}$.

b) [5] [a b/c] [9] [−] [2] [a b/c] [7] [=]

Answer $= \frac{17}{63}$.

Evaluate the following using your calculator.

1. $\frac{2}{7}+\frac{4}{5}=$
2. $\frac{7}{11}-\frac{1}{3}=$
3. $\frac{2}{9}+\frac{4}{7}=$
4. $\frac{15}{16}-\frac{2}{3}=$
5. $\frac{14}{15}+\frac{3}{4}=$
6. $\frac{9}{13}+\frac{2}{3}=$
7. $\frac{11}{15}-\frac{1}{4}=$
8. $\frac{7}{8}-\frac{6}{25}=$
9. $\frac{4}{9}+\frac{2}{3}=$
10. $\frac{7}{8}-\frac{5}{12}=$



Application Problems

Answer the following questions.

11. Juan spent $\frac{1}{6}$ of her income on rent, $\frac{1}{3}$ on food and clothes and $\frac{3}{8}$ on other expenses. What fraction of her income did she save?

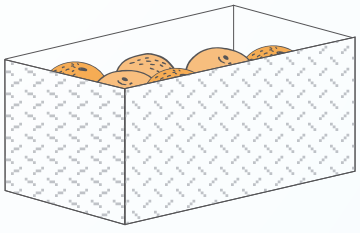
12. Gareth was asked to select the largest of the three fractions $\frac{5}{12}$, $\frac{3}{9}$ or $\frac{4}{7}$. Which should he select?

13. On a car trip a family travels $\frac{1}{2}$ of the journey in the morning and $\frac{1}{3}$ of it in the afternoon. If they still have 200 km to travel how long is the entire journey?

14. When he dies a man leaves $\frac{1}{2}$ of his estate to his wife, $\frac{3}{16}$ to each of his two sons and the rest to his only daughter. What fraction of the estate will the daughter receive?

Problem Solving

A box half–full of oranges weighs 10 kg (includes box + oranges), and when it is one–third full it weighs 7 kg. What does the box weigh when it is full of oranges?



I found this work

Easy OK Difficult

Proportion completed

None Few Half Most All

Date: _____

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Ratios – Simplify and share a quantity in a given ratio.

A ratio is written in the form **a : b** (or **p : q : r**) and operates very much like a fraction with a + b (or p + q + r) parts. Units (e.g. $) are left out when they are the same but changed to the same unit first if they are different.

Examples

a) Simplify the ratio \$4.00 : \$20.00

b) Share \$20 in the ratio 2 : 3

a) Dividing both \$4 and \$20 by the common factor of 4 and dropping the units we obtain

\$4.00 : \$20.00 = 1 : 5

b) If we are sharing anything in the ratio of 2 : 3 then there are 2 + 3 = 5 parts. One person gets 2 of the 5 parts and the other 3 of the 5 parts.

Share \$20 in the ratio of 2 : 3 = $\frac{2}{5}$ of \$20 : $\frac{3}{5}$ of \$20

= \$8 and \$12.

Problems

Simplify the following ratios.

1. 18 : 30 = ____ : ____
2. \$2 : 50¢ = ____ : ____
3. 100 : 85 = ____ : ____
4. 580 g : 1.3 kg = ____ : ____
5. 81 : 24 = ____ : ____

Divide the quantities in the ratios given.

6. \$100, in the ratio 4 : 6 is ____ : ____
7. 120 cm, in the ratio 7 : 5 is ____ : ____
8. 5.6 kg, in the ratio 3 : 5 is ____ : ____
9. 1024, in the ratio 5 : 11 is ____ : ____
10. \$156, in the ratio 5 : 8 is ____ : ____

Application Problems

Answer the following questions.

11. The quantity of meat given in a casserole recipe for 24 people is 6 kg. If there are 9 people at a dinner party, how much meat will need to be purchased?

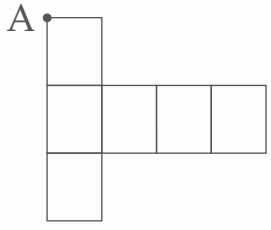
12. Evona and Omar buy a Lotto ticket between them, with Evona paying \$1.50 and Omar paying \$3.50. If the ticket wins a division 4 prize worth \$35, what amount will each get for their winnings?

13. A salesman travelled 450 km in a day: one–third of the distance before lunch and two–fifths between lunch and tea. The rest was after tea. Write a ratio for the distance travelled before lunch : between lunch and tea : after tea.

14. The three members of a relay team divide a race between them into the ratio 4 : 5 : 3. If the race is 36 km long how far does each member of the team run?

Problem Solving

A line is to be drawn through A to divide the shape into two parts equal in area. Draw in the line.



I found this work Easy OK Difficult

Proportion completed None Few Half Most All

Date: _____

Percentage Change – Calculate percentage change.

Example

A painting is bought for $15 000 and 3 years later sold for $20 000. What is the percentage change (increase)?

To calculate percentage change we use the formula $\frac{\text{Difference}}{\text{Original}} \times 100$

$$\text{Percentage change} = \frac{(20000 - 15000)}{15000} \times 100$$
$$= 33.3\% \text{ (1 dp)}$$

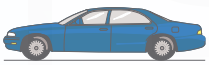
Application Problems

Answer the following questions.

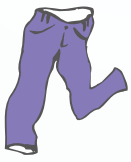
1. Zina's weight increases from 52 kg to 60 kg over a period of 3 months. What is the percentage change in Zina's weight?

2. The government valuation of Kevin's apartment increases from $285 000 to $320 000 over four years. What is the percentage change in the valuation of Kevin's apartment?

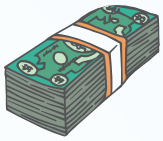
3. Irene's car was valued at $25 000 when she purchased it 5 years ago. The car's value now is $15 000. What is the percentage change in the value of Irene's car?



4. A pair of jeans was reduced by $20.00 from their original price of $95.00. What is the percentage reduction in the price of the jeans?



5. Shona's weekly pay was $258.00. After she received a pay rise her pay increased to $315.00 per week. What percentage increase in pay did Shona receive?



6. A retail outlet buys computer games from a wholesaler at $65 each and sells them at $115 each. What percentage profit does the retail outlet make on each game?

7. In 1961 the population of Wanganui was 35 700. The current population is 40 600. What percentage increase is this?

8. Nina obtained a quote to carpet her home. The price was $8900 but if she pays within 7 days of the carpet being installed it will only cost her $7800. What percentage saving is there for Nina if she pays within 7 days?

9. Tane intends to put down a hangi at the school gala. The cost of the meat and vegetables will be $650 and Tane expects to sell 300 tickets at $5 each. What percentage profit will Tane make if he sells 300 tickets?

10. Wu purchases a digital camera valued at $350, which he subsequently sells on Trade Me for $240. What is his percentage loss?

I found this work

Easy OK Difficult

Proportion completed

None Few Half Most All

Date: _____

Applications of Rounding – Round numbers sensibly.

Example

The total bill for Year 10 text books at a college was $6026 for 197 books. What would be the replacement cost to charge a student who lost his or her book?

Replacement cost = $6026 ÷ 197
= $30.5888
= $30.59 (2 dp)

As money is always rounded to 2 decimal places.

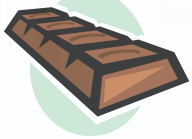
Application Problems

Evaluate the following, rounding sensibly.

1. The costs in constructing a kitset garden shed are: floor $9.95 per m^2; shed $399; paint $79 and paving $15.89 per m^2. What are the total costs for a shed of 9.6 m^2 floor area?

2. 7 students went to a restaurant for dinner. The total bill was $109.25. If the cost was split evenly, what was each person's share?

3. The profit made on chocolate bars sold at a dairy is 28.4¢ per bar. In a one–week period the dairy sells 327 chocolate bars. How much profit has the dairy made?

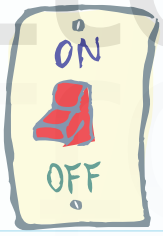


4. To construct a 36 m fence the materials needed are 8 posts at $9.29 each, 14 railings at $4.76 each and 70 palings at $2.99 each. What is the cost per metre for the fence?

5. A bike is for sale at $757. To buy it on hire purchase, interest free, requires a deposit of $107 and the remaining $650 is to paid off in 18 months. What would the payment per month need to be to the nearest dollar?

6. A drilling rig drills, on average, 4.32 m in an hour. The rig is operational 9.6 hours a day for 7 days of the week. How far, to the nearest metre, will it drill in one week?

7. Amir's latest 60 day power bill states that he used 834 units of electricity. The unit charge is 12.24 ¢ per unit and the daily charge is 61.11 ¢ per day. What is his average daily charge?



Fun Spot

Move only 1 match to make a perfect square.

I found this work

Easy OK Difficult

Proportion completed

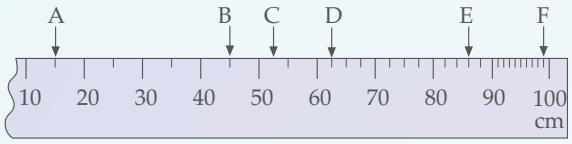
None Few Half Most All

Date: _____

Scales – Use equipment to make measurements.

Example

As accurately as possible read the indicated measurements displayed on the scale below.



Before reading off the measurements be sure to identify the value of the small divisions between the given numbers.

A = 15 cm B = 45 cm

C = 52.5 cm D = 62.5 cm

E = 86 cm F = 99 cm

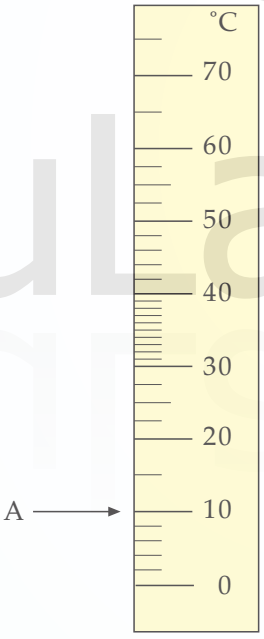
Problems

1. On the scale below mark with an arrow the listed values (the first one is done for you).

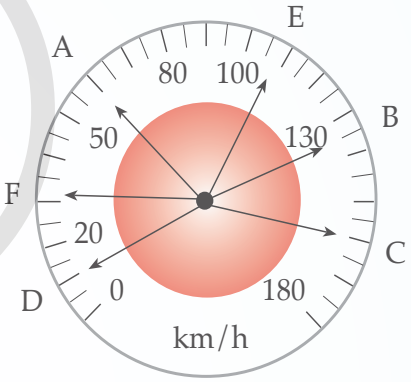
A = 10°C B = 75°C C = 48°C

D = 32°C E = 62.5°C F = 2°C

G = 41°C H = 80°C I = 16°C



2. Estimate the speeds in km/h represented by each of the letters below.

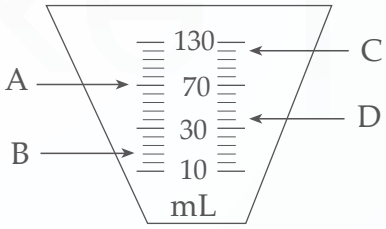


A = _____ B = _____

C = _____ D = _____

E = _____ F = _____

3. For each letter read off the level on the container below.



A = _____

B = _____

C = _____

D = _____

Problem Solving

Divide this 5 x 5 square into 5 sections, so that each section contains the numbers 1, 2, 3, 4 and 5 only.

2	1	3	4	3
5	2	5	2	4
4	3	1	4	1
3	5	2	1	3
1	4	5	2	5

I found this work

Easy OK Difficult

Proportion completed

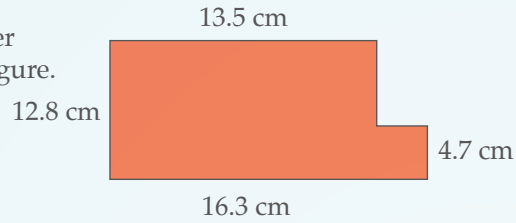
None Few Half Most All

Date: _____

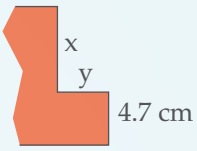
Perimeter – Calculation and applications of perimeter of simple composite shapes in context.

Example

Find the perimeter of this figure.



We begin by labelling the missing lengths x and y and calculating them.

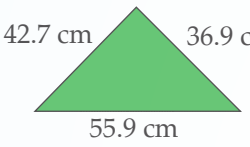


Length x = 12.8 – 4.7
= 8.1 cm
Length y = 16.3 – 13.5
= 2.8 cm
Perimeter = 12.8 + 13.5 + 8.1 + 2.8 + 4.7 + 16.3
= 58.2 cm

Problems

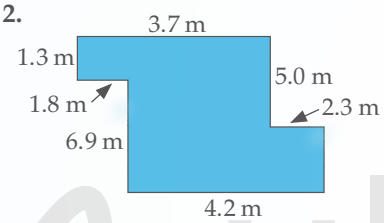
Find the following perimeters.

1.



P =
=
=

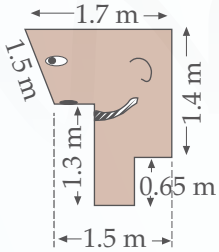
2.



Note: You need to calculate the length of one side.

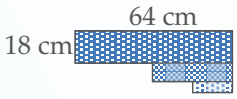
P =

3.



P =
=
=

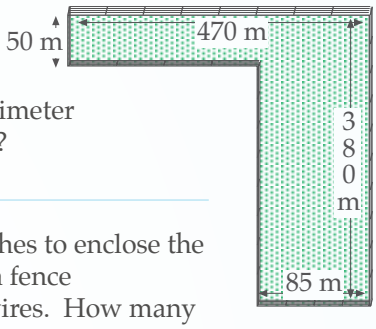
4.



Each successive rectangle is half the length and width of the previous one. Find the total perimeter.

P =

5. A farmer has an L shaped paddock 470 m by 380 m.

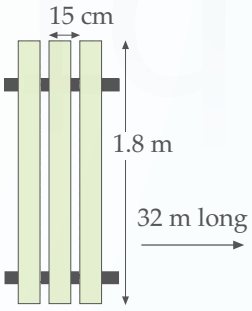


a) What is the perimeter of the paddock?

b) The farmer wishes to enclose the paddock with a fence comprising 6 wires. How many metres of wire will be required?

c) In order to get fit, the farmer decides to jog around the outside of the paddock. He wishes to run at least 10 km a day. How many complete laps of the paddock must he do?

6. A wooden fence is to be constructed from 1.8 m high palings. Each paling covers 15 cm and the fence is to be 32 metres long.



a) Assuming there are no gaps between the palings, how many palings will be required for the fence?

b) Timber for the palings costs $4.52 per metre. What will the cost of the palings be?

I found this work

Proportion completed

Date:

Factorising – Quadratics – Factorise quadratics.

Example 1

Factorise $x^2 + 6x + 8$

We identify two numbers that multiply to give the last term (i.e. 8) and add to give the middle term (i.e. 6).

Possibilities

$^+1 \times {}^+8 = {}^+8 \quad {}^+1 + {}^+8 = {}^+9$ ✗
$^-1 \times {}^-8 = {}^+8 \quad {}^-1 + {}^-8 = {}^-9$ ✗
$^-2 \times {}^-4 = {}^+8 \quad {}^-2 + {}^-4 = {}^-6$ ✗
$^+2 \times {}^+4 = {}^+8 \quad {}^+2 + {}^+4 = {}^+6$ ✓

Therefore factors are $(x + 2)(x + 4)$

Example 2

Factorise $m^2 - 5m - 14$

We identify two numbers that multiply to give the last term (i.e. $^-14$) and add to give the middle term (i.e. $^-5$).

Possibilities

$^-1 \times {}^+14 = {}^-14 \quad {}^-1 + 14 = 13$ ✗
$^+1 \times {}^-14 = {}^-14 \quad {}^+1 + {}^-14 = {}^-13$ ✗
$^+7 \times {}^-2 = {}^-14 \quad {}^+7 + {}^-2 = 5$ ✗
$^-7 \times {}^+2 = {}^-14 \quad {}^-7 + {}^+2 = {}^-5$ ✓

Therefore factors are $(m - 7)(m + 2)$

Factorise the following.

1. $x^2 + 5x + 6 = (x + 3)(x + ____)$
2. $k^2 + 9k + 20 = (k + 5)(k + ____)$
3. $n^2 + 2n + 1 = (n + 1)(n + ____)$
4. $q^2 + 8q + 15 = (q + ____)(q + ____)$
5. $t^2 - 6t + 8 = (t - 4)(t - ____)$
6. $p^2 - 11p + 24 =$ ____
7. $x^2 - 4x + 4 =$ ____
8. $v^2 - 7v + 6 =$ ____
9. $k^2 + 6k - 16 =$ ____
10. $g^2 + 10g - 24 =$ ____
11. $x^2 - 5x - 36 =$ ____
12. $n^2 - 11n - 26 =$ ____
13. $d^2 - 8d =$ ____
14. $u^2 + 12u =$ ____
15. $x^2 - 4 =$ ____
16. $x^2 - 36 =$ ____
17. $k^2 + 15k + 56 =$ ____

Problem Solving

A natural health foods store has 7 very regular customers. Customer 1 shops at the store every day. Customer 2 shops at the store every second day. Customer 3 shops at the store every third day etc.

How many days from today (when everyone was at the shop) will all 7 regular customers shop at the health foods store on the same day?

I found this work: Easy | OK | Difficult

Proportion completed: None | Few | Half | Most | All

Date: ____

Writing Equations – Write simple linear equations.

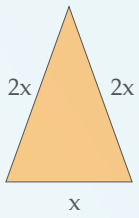
Example

The two equal sides of an isosceles triangle are twice as long as the shortest side.

The perimeter of the triangle is 45 cm.

How long is the shortest side?

Draw a diagram labelling the shortest side x and the longer sides 2x.



$$2x + 2x + x = 45$$
$$5x = 45$$
$$x = 9$$

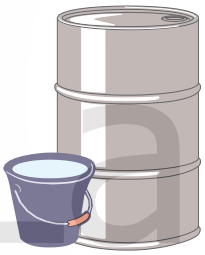
Shortest side is 9 cm

Problems

Use the information given to write an equation and then solve the equation.

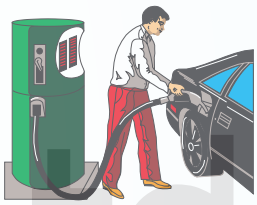
1. Two of the angles of an isosceles triangle are equal and the third angle is 32°.
   What size are the two equal angles?

2. It takes exactly 12 buckets of water plus 8 litres to completely fill a 140 litre drum.
   How much water is there in each bucket?



3. Five equal packets are placed in a 2 kg container and weighed. The total weight is 17 kg.
   How much does each packet weigh?

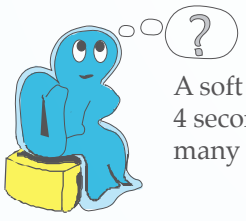
4. A sales representative drives regularly from Auckland to Wellington and back, a distance of 1305 km. It takes 2 full tanks of fuel at 60 litres each plus 25 extra litres to travel the total distance.



   a) How many litres of petrol does he use?

   b) How many kilometres does he travel per litre?

Problem Solving



A soft drink manufacturer produces one can of soft drink every 4 seconds. If the factory is open 8 hours a day, 5 days a week, how many cans would the manufacturer produce in a week?

I found this work

Proportion completed

Date: _____

Adding and Subtracting Algebraic Terms – Combine simple and more complicated like terms.

Example

Simplify $4a^2 - 3a + 2 + a^2 + 9a$

We begin by identifying the like terms and their sign.

$4a^2$ $-3a$ $+2$ $+a^2$ $+9a$

Note: Terms of a^2 and terms of a are different.

$$4a^2 + a^2 = 5a^2$$

$$-3a + 9a = 6a$$

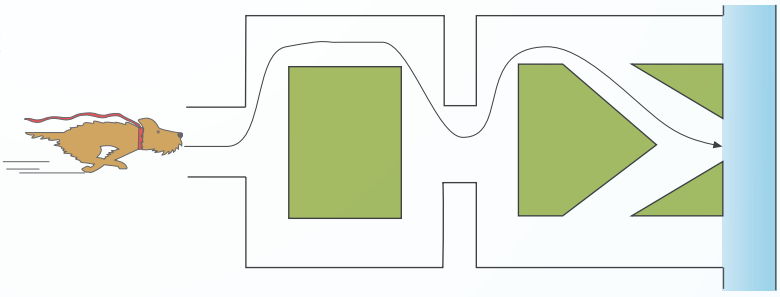
$$4a^2 - 3a + 2 + a^2 + 9a = 5a^2 + 6a + 2$$

Simplify the following expressions.

1. $4a + 5a =$ _____
2. $3x + 2 + 5x - 6 =$ _____
3. $m + 2 + 3m - 2 =$ _____
4. $5 + 2x + 8 - x =$ _____
5. $9 - 2x - 4 + 2x =$ _____
6. $1 + y - 5 + y =$ _____
7. $8 - 2z - 8 - 2z =$ _____
8. $2k^2 + 3k + 4k^2 - 2k =$ _____
9. $4mn + 6 - 9mn - 3 =$ _____
10. $4q^3 + 7p - q^3 + 8p =$ _____
11. $-5xy + 3x - 2y + 6xy =$ _____
12. $4ab + 12 + 3ab - 15 + ab =$ _____
13. $x^2 + 4x + 3 - 2x^2 =$ _____
14. $9k + 12s - 14s + 6k - 3s =$ _____
15. $pq - 7q + 4p - 9pq + 2q =$ _____
16. $3x^2 - 7x + 9x^2 + 12x - 4 =$ _____
17. $14y - 9 - 8y - 6 =$ _____
18. $4r^2 + 8k - r^2 - 12k =$ _____
19. $v^3 + 3v^2 - 7v - 4v^3 =$ _____
20. $14xy - 7x + 15y - 13xy =$ _____

Problem Solving

How many different paths can the dog take to reach the river while always running towards the river?
(One way is drawn for you).



Number of ways _____

I found this work: Easy | OK | Difficult

Proportion completed: None | Few | Half | Most | All

Date: _____

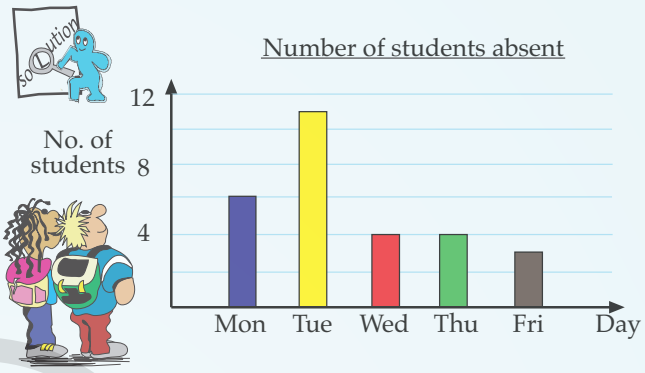
Bar Graphs – Displaying data appropriately and commenting on data displays.

Example

Draw a bar graph for the number of students absent, from a small school, each day for a week.

Day	Frequency
Mon	6
Tue	11
Wed	4
Thu	4
Fri	3

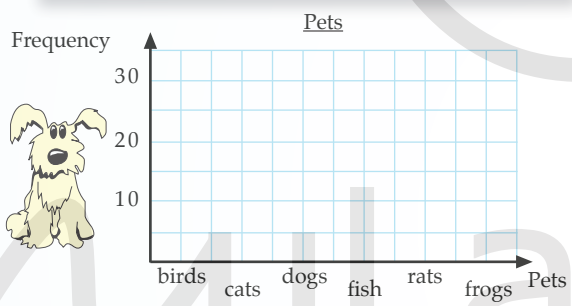
A bar graph has separate bars. The bars can be any width but they must not touch each other.



Application Problems

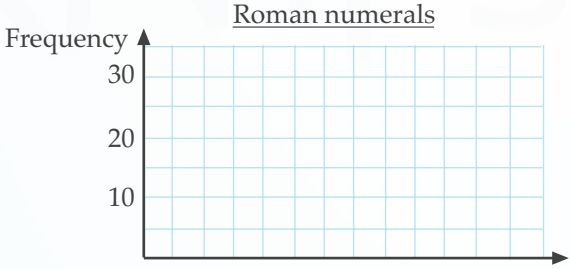
1. Draw a bar graph for the data in the table below.

Pets	birds	cats	dogs	fish	rats	frogs
Frequency	6	24	18	5	10	5



2. Draw a bar graph for the frequency of each letter of the following Roman numerals.

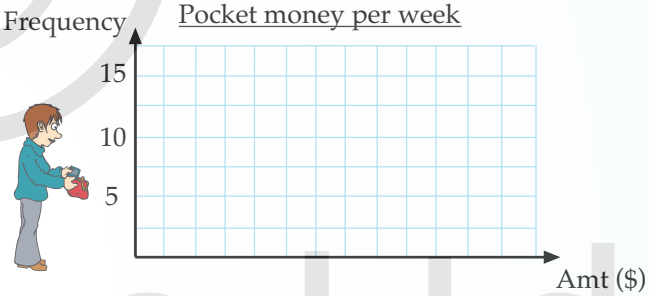
DXCII, MDCXCI, MCCCLVI, CII, MVII, CCL, CCXCIV, MMD, VIII, XVII, LXXVIII, CCCX, LIII, XVII, MIII, MXLII, DCCCLIV.



The amount of pocket money members of a Year 10 class receive per week is given below.

$10, $0, $0, $5, $2.50, $0, $0, $12.50, $5, $12.50, $12.50, $15, $5, $0, $2.50, $5, $0, $0, $7.50, $15, $2.50, $0, $0, $15, $10, $0, $0, $2.50.

3. Draw a bar graph for this information.



4. How many students received no pocket money?

5. How many students received $10 or more?

6. What is the total amount of pocket money received by the students?

7. The mean amount of money was?

8. The median amount of money was?

9. Which average best describes what a typical student gets in pocket money?

Problem Solving

When emptying a money box it was noticed that there were equal numbers of $2, $1, 50¢, 20¢ and 10¢ coins. If the total amount of money in the box was $22.80, how many of each coin were there?

I found this work: Easy OK Difficult

Proportion completed: None Few Half Most All

Date: _____

Pie Graphs – Displaying data appropriately and commenting on data displays.

Example

Susan's typical day is sleep 10 hours, eat 1 hour, sport 2 hours, school 6.5 hours, TV 3 hours, other 1.5 hours. Draw a pie graph of her typical day.

For a pie graph we calculate the angle using the rule

$$\text{angle} = \frac{\text{item}}{\text{total}} \times 360^\circ$$

Sleep $= \frac{10 \times 360^\circ}{24}$

$= 150^\circ$

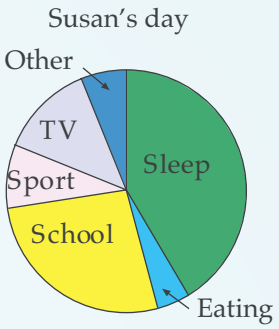
Eat $= \frac{1 \times 360^\circ}{24}$

$= 15^\circ$

Sport $= \frac{2 \times 360^\circ}{24}$

$= 30^\circ$

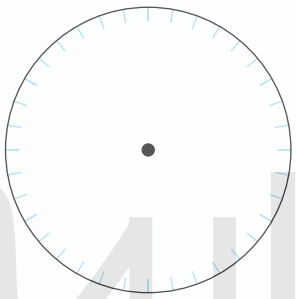
etc.



Application Problems

1. Construct a pie graph of a typical day for Jeff. He spends 9.5 hours in bed, 7 hours at school, 1.5 hours on homework, 1 hour travelling on his bike, 1 hour on sport, 3 hours on TV and 1 hour on other things.

Jeff's day



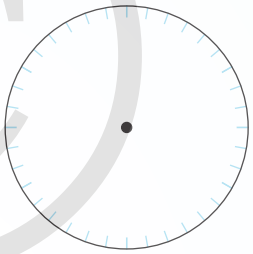
2. The amounts a school spends on different activities are listed below. All amounts are in thousands of dollars.

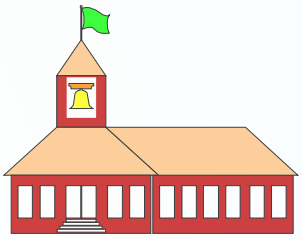
Administration 210, Departments 310, Library 50, Buildings and Maintenance 150, Sport 30, Student support 35, Grounds 80, Health and Safety 20 and Publicity 15.

a) What is the total amount spent on running the school?

b) Construct a pie graph for this information.

School expenditure





c) What is the total expenditure spent on Administration, Buildings and Maintenance, Grounds and Health and Safety?

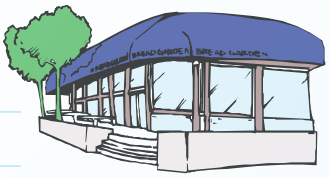
d) What is the percentage of all expenditure spent on Administration?

e) What percentage of the expenditure is spent on educating students (Departments and Library)?

f) What percentage of the expenditure is spent on property (Grounds, Buildings and Health and Safety)?

Communication Problem

The school in question **2.** above says it is focussed on the academic education of its students. Make a valid comment on this statement using the information from the question.



I found this work

Easy OK Difficult

Proportion completed

None Few Half Most All

Date: _____

Experimental Probability – Calculate relative frequencies using the results of an experiment.

Example

A student has been late for school 32 times in the last 80 school days. What is the probability (relative frequency) that the student is late on any given day?

Solution

$$\text{Prob.} = \frac{32}{80} = 0.4$$

Number of times event occurs, i.e. late 32 times.

Total number of events or occasions = 80

Problems

Express answers exactly, as a fraction or round your answer to 3 significant figures.

1. A class conducted an experiment of tossing a drawing pin and seeing if it landed pin up. The results were pin up 375, pin down 125.

a) How many times was the drawing pin thrown?

Find the probability (relative frequency) that on a future throw it lands

b) pin up.

c) pin down.

2. A manufacturer produces a dog badge that has flashing eyes. Testing has shown that in a batch of 240 badges, 16 failed to work.

a) Find the probability (relative frequency) of a randomly selected badge failing.

b) How many of the month's production of 6000 would be expected to fail?

3. An electrical supply authority reported that they averaged the following per week: true faults 34, pole fuses 7 and false alarms 23. Find the probability that the next reported fault is

a) a pole fuse.

b) not a false alarm.

c) How many false alarms would be expected per year?

4. A large bag has coloured marbles in it. An experiment is conducted by taking out marbles, recording their colour and replacing them. The results to date are:

Colour	Green	White	Red	Blue
Number	9	11	4	16

a) How many marbles have been examined?

Find the probability (relative frequency) of

b) a white marble.

c) a red marble.

d) Out of 600 marbles, how many would you expect to be white?

The experiment is to be stopped when 100 red marbles have been removed.

e) How many marbles in total would you expect to have been examined by that time?

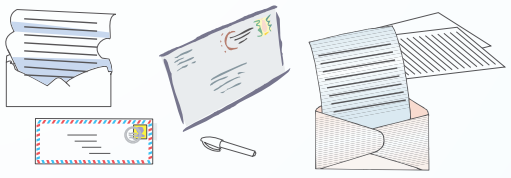
f) Find the probability that the next marble is white or red.

g) Find the probability that the next marble is not white.

h) Find the probability that the next marble is green, white, red, or blue.

Problem Solving

You have written 4 letters to different people. How many different ways can these letters be placed in the 4 addressed envelopes?



I found this work

Easy OK Difficult

Proportion completed

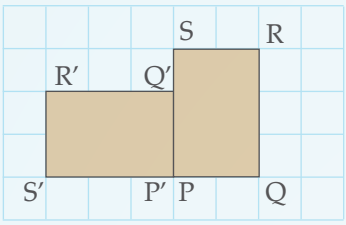
None Few Half Most All

Date: _____

Properties of Transformations – Identifying invariant properties of transformations shown in an object.

Example 1

Describe fully the transformation below.



Solution

Rotation 90° anticlockwise about the point P.

Notes

An invariant property is an aspect of the object that does not change when it is transformed.

Example 2

Which transformations leave area invariant?

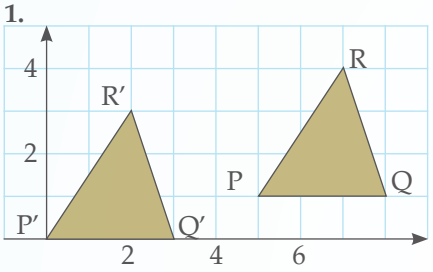
Solution

Reflection, Rotation and Translation. Only enlargement changes the area.

Problems

Name and fully describe each transformation below.

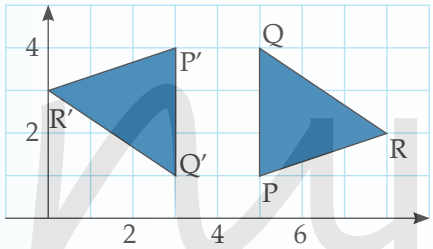
1.



Name

Description

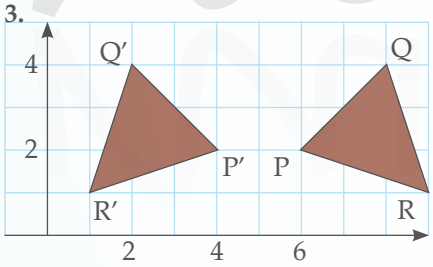
2.



Name

Description

3.

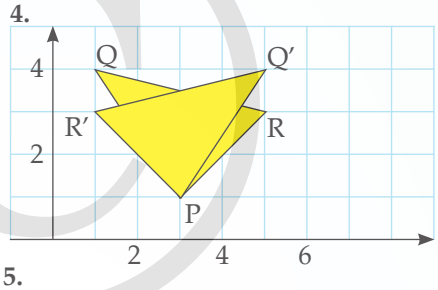


Name

Description

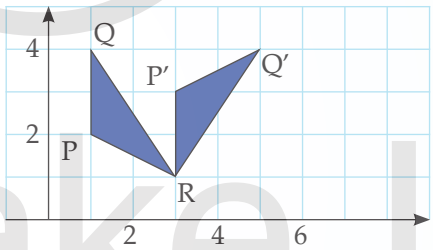
For each transformation identify the points on the entire plane that are invariant.

4.



Invariant points

5.



Invariant points

6. Complete the chart of invariant properties below, for the four transformations.

	Rotation	Reflection	Translation	Enlargement
Angle size	✓	✓	✓	✓
Area				
Line length				
Sense – the direction you go around it.				

Fun Spot

Complete the magic square so each row, column and diagonal adds to 34. Each number from 1 to 16 is used once.

12	13		
		15	10
7		14	
9	16		

I found this work

Easy OK Difficult

Proportion completed

None Few Half Most All

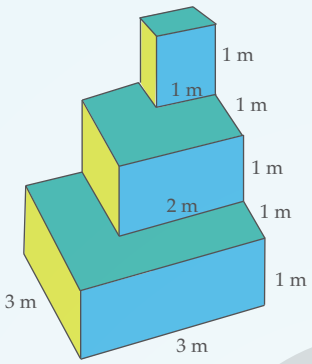
Date: _____

Isometric Drawing 1 – Drawing a 3-D shape from cubes on isometric paper.

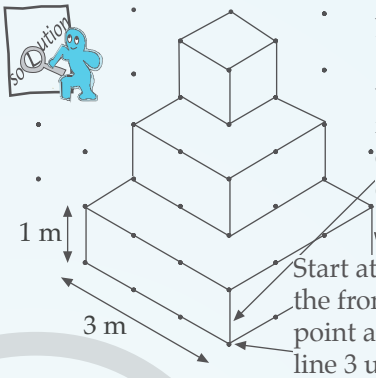
Example

Draw the 3-dimensional shape on the right on the isometric graph paper.

Note: 1 unit = 1 metre.



Solution



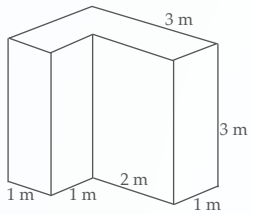
Draw 1 unit vertically from each of the corners.

Start at the front left point and draw a line 3 units long.

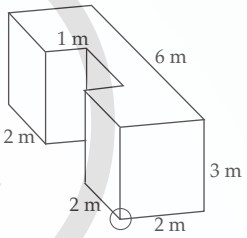
Problems

Redraw the following shapes isometrically first and then on the grid provided draw the left, front, right, top and back views.

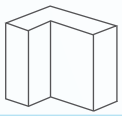
1.

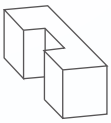


2.



Start here





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I found this work

Easy OK Difficult

Proportion completed

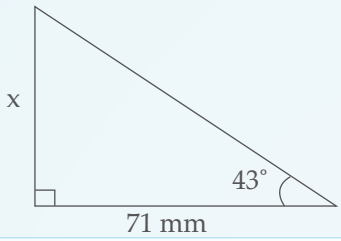
None Few Half Most All

Date: _____

Tangent – Finding opposite and adjacent sides using trigonometry.

Example

Calculate the length of x.



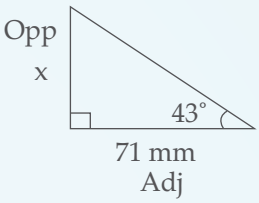
Label the sides of the triangle first.

$$\tan\theta = \frac{\text{Opp}}{\text{Adj}}$$

$$\text{Opp} = \text{Adj} \times \tan\theta$$

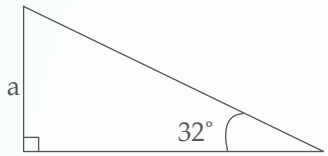
$$x = 71 \tan 43^\circ$$

$$= 66.2 \text{ mm (3 sf)}$$

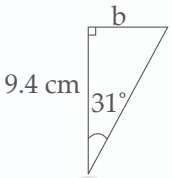


Find the missing lengths to 3 significant figures using tangent. Always label the sides of the triangle first.

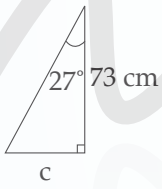
1.



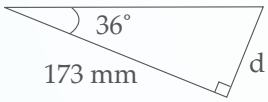
2.



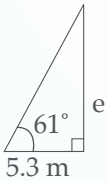
3.



4.

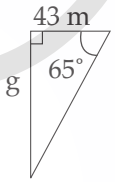


5.



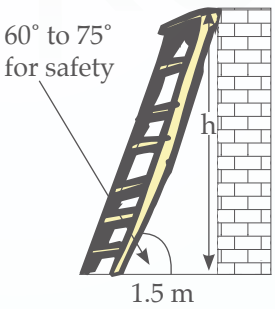
6.

7.



Application Problem

A ladder is meant to be placed against a wall at an angle of between 60° and 75° for safety. If the ladder is 1.5 metres from the wall what is the maximum height it can reach up the wall?



I found this work

Proportion completed

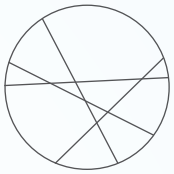
Date: _____

Page 38 Graphs

1. 11.00 am
2. 1 pm
3. 5 pm
4. 7 pm
5. 4 hours
6. 40 km
7. 6 to 7 pm and 8 to 9 pm.
8. 7.15 pm ± 5 min
9. 220 km
10. 1 to 6 pm. (line not as steep)
11. 70 km
12. 65 km/h
13. 11 am to 1 pm. Speed 10 km/h
14. 26 km/h
15. Katie. Katie's average speed is 27.5 km/h.

Problem Solving

11 pieces.



Page 39 Time

1. 0545
2. 1815
3. 0345
4. 2252
5. 2.25 am
6. 5.42 pm
7. 11.56 am
8. 4.5 h
9. 5.2 h
10. 2.67 h (2 dp)
11. 30 km/h
12. 24.86 km/h
13. 14 hours 57 mins
14. 22 hours 40 mins
15. 8 hours 55 mins
16. 1805 hours
17. a) 2.6 h
b) 466.2 km/h

Problem Solving

52 rectangles.

Page 40 Rates of Change

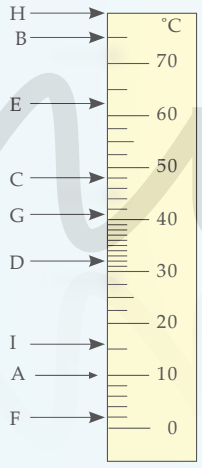
1. 10 km/h
2. 30 km/h
3. 7 - 8 pm and 9 - 11 pm.
4. She is stationary.
5. $1300
6. $1500
7. Increase. Steeper gradient.
8. $8800

Problem Solving

Members = 96

Page 41 Scales

1.



2. A = 60 km/h
B = 135 km/h
C = 160 km/h
D = 10 km/h
E = 107 - 108 km/h
F = 31 - 32 km/h

3. A = 70 mL
B = 18 mL
C = 118 mL
D = 38 mL

Problem Solving

2	1	3	4	3
5	2	5	2	4
4	3	1	4	1
3	5	2	1	3
1	4	5	2	5

Page 42 Measurement Crossnumber

			c	u	b	o	i	d						
					x						v			
	1	.	9	5	h	a				c	o	n	e	
1	3										l			
0	0			t	r	a	p	e	z	i	u	m		
0	0										m			
0	0		2	1	5	7		s	p	h	e	r	e	
c			3		2				e			a		
m^3	2	8	.	8	c	m^2			r		π	d		
			4		m				i			i		
3	.	1	4	1	6			a		m	l		u	
		4		2				r		e			s	
		5		t	a	n	g	e	n	t				
		9			r			a		e				
					c	m			p	r	i	s	m	

Page 43 Measurement Review

1. 55.2 cm
2. 27.0 m (1 dp)
3. 132.2 m^2 (1 dp)
4. 2.7
5. 2.53
6. 0.451
7. 777
8. A = 7.5
B = 16.25 or 16 (0 dp)
9. a) Vol. = 4.6 m^3 (1 dp)
b) Cap. = 4600 L (2 sf)
10. a) $18.00
b) $33.50
11. 5 hours 13 mins
Depart 1012
Arrive 1525
12. a) 25 units/h
b) 24.6 units/h