How to Conquer Fractions, Decimals & Percentages Vol 4 *Problem Solving*

Intelligent Australia Productions

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Intelligent Australia Productions
PO Box 670
Hillarys, WA 6923
Australia

Tel: (08) 9307 8365
Fax: (08) 9402 2339
Email: intelligent.australia@yahoo.com

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This book is dedicated to:
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Intelligent Australia Productions is committed to raising standards in Literacy and Numeracy in Australian schools.

IAP
PO Box 670
Hillarys, WA
Australia 6923

- Email

intelligent.australia@yahoo.com

- Telephone

(08) 9307 8365 Int'l (618) 9307 8365

- Fax

(08) 9402 2339 Int'l (618) 9402 2339

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Teachers Notes

About the Series

The 'How to Conquer Fractions, Decimals & Percentages' series was written in response to a pressing need. Most teachers of upper primary school classes would agree that this area of the Maths syllabus, along with Problem Solving, presents the most difficulties for students.

The series consists of four books:

- How to Conquer Fractions, Decimals & Percentages **Vol 1 *Fundamentals***
- How to Conquer Fractions, Decimals & Percentages **Vol 2 *Method***
- How to Conquer Fractions, Decimals & Percentages **Vol 3 *Conversions***
- How to Conquer Fractions, Decimals & Percentages **Vol 4 *Problem Solving***

The books are sequential, beginning with the most basic concepts in Volume 1, progressing through the steps required to work with and manipulate fractions, decimals and percentages, and concluding with examples based on everyday life where students can apply the skills gained from the earlier volumes.

How to Conquer Fractions, Decimals & Percentages Vol 4 *Problem Solving*

Problem solving involving fractions, decimals and percentages is perhaps the area of the maths syllabus in the latter primary school years that students have most difficulty with. This is to be expected in some ways because, not only do students have to recall particular maths skills, they need to draw on higher-order levels of thinking in order to use and apply these skills to simulated real-life situations.
The complexity of such tasks for young minds is well understood by the author who has been careful to present problems in a way devoid of all ambiguity. To give problems more relevance and meaning for the students, situations and settings familiar to them (such as the school playground, the shopping centre, cinema, sports and computers) occur frequently throughout.

Some of what your students will learn:

- *When reading the question look for a key word(s) which will provide clues to the particular arithmetic operation(s) to use.*
- *Be aware that some problems may appear simple but actually require you to make two steps, not one.*
- *It's important to show your working, even if you're able to calculate the correct answer mentally (sometimes you may get a wrong answer but will still get marks for your working).*
- *It's often possible, and advisable, to work backwards from your answer; if you arrive at the original data there's a good chance you got the question right; if not, re-work it and see what you come up with this time.*

About the Author

Ron Shaw is a highly experienced classroom teacher.
He is the author of some 30+ educational books, many of which are used in schools in several English-speaking nations. Ron has teaching qualifications from Edith Cowan University (Perth) and is a graduate of the Australian National University (Canberra).
He is a member of the Australian College of Education, the Australian Teaching Council, the Australian Association of Mathematics Teachers and the Mathematical Association of Western Australia.

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Out and About

Susie and her brother Samuel.

1 Susie was on the swing for 20 minutes.
For a quarter of that time she was just sitting and the rest of the time she was swinging back and forth.
For how many minutes was Susie actually swinging?

working-out and answer space

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2 Susie swung very high a few times. The highest she got was 4m above ground level. Her next highest swing was $^{3}/_{4}$ of that height.
How much above ground level did Susie go on her second highest swing?

working-out and answer space

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3 Samuel is a keen basketballer and practises shooting at the hoop every day. On Monday he had 20 shots and the ball went through the hoop on $^{7}/_{10}$ of his throws. How many of Samuel's shots were successful on Monday?

working-out and answer space

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4 Samuel also enjoys riding on his roller blades. On the weekend he left home on his blades at 2pm and returned at 2.50pm.
He was blading for $^{4}/_{5}$ of the time he was away (he stopped for a drink). For how many minutes was Samuel riding on his blades?

working-out and answer space

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5 Susie is very good at skipping. She and her friend Jules had a competition to see who could do the most skips before tripping up. Susie got to 400 and then had to stop as she was out of breath. Then it was Jules' turn. Jules reached $^{7}/_{8}$ of Susie's score before she tripped over her rope. How many skips did Jules complete?

working-out and answer space

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6 In the next school holidays Susie and Samuel are going on a sailing holiday with their parents. Susie has saved up $60 so far and Samuel has saved $^{2}/_{3}$ of that amount. How much have they saved altogether?

working-out and answer space

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At the Movies

1 Jack and Ruby watched a great movie on Saturday night. The movie went for 2 hours and for $^1/_{20}$ of that time Jack and Ruby were eating popcorn.
For how many minutes were Jack and Ruby eating popcorn?

working-out and answer space

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2 'Miss Perfection' was showing at the Starlight Cinema.
One of the main actors, Sophie Mills, was on screen for $^1/_3$ of the time that the movie was running.
The movie ran for one and a half hours so for how long was Sophie on screen?

working-out and answer space

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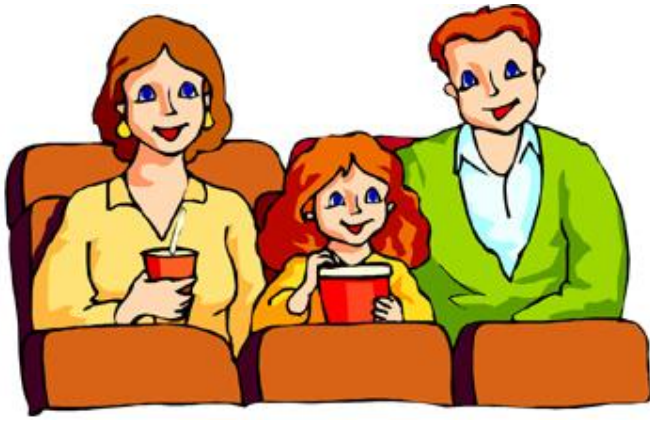

3 Pippa Wilson went to see a movie with her Mum and Dad. The Wilsons paid a total of $35 for their three tickets. How much was an adult's ticket if Pippa's ticket was $^1/_5$ of the total the Wilsons spent on their tickets?

working-out and answer space

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4 'The Greatest Show on Earth', a movie about a famous circus, screened for ten weeks (Mon-Sun) in Brisbane. There was a full house (cinema was full) on $^1/_7$ of the days that the film screened.
On how many days was the cinema **not** full?

working-out and answer space

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5 The cast (the actors) in 'The Greatest Show on Earth' numbered 84. If $^1/_7$ of the cast were under 21 years of age and $^1/_3$ of the cast were adult females, how many of the cast were adult males? *adult =21 or over*

working-out and answer space

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Computer Stories

1 Joey's spends a lot of time at his computer. $^1/_6$ of Joey's computer time is spent writing emails and $^2/_3$ of his time on the computer is spent surfing the internet.
What fraction of Joey's computer time is spent surfing the internet and writing emails?

working-out and answer space

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2 Adele uses her computer to type up her school homework. Last Thursday she spent $^2/_5$ of her computer time doing a Science project and $^1/_{10}$ of her computer time doing English homework. What fraction of the time that Adele spent at her computer was used up doing her Science project and English homework?

working-out and answer space

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3 Santa is sitting at his computer planning out his next Christmas visits. He knows that when he goes to Australia $^3/_8$ of the children he'll visit will be under 4 years of age, $^3/_8$ will be between 4 and 8, and $^1/_4$ of the children he'll go to will be over 8 years of age. What fraction of the children who Santa will visit in Australia will be 4 years old or older?

working-out and answer space

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4 Donatis Duck was looking for some good duck graphics to use in his World of Ducks project. He found lots of duck graphics but couldn't use some because they were unsuitable in some way. $^1/_{12}$ of the duck graphics Donatis found were black and white and he didn't want to use those. $^1/_6$ of the graphics found by Donatis were not of good quality and he didn't want to use those either. What fraction of the duck graphics that Donatis found were either black and white or not of good quality?

working-out and answer space

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Holidays

1 Lucky Larry was sunning himself on a tiny tropical island when he noticed a flock of birds in the sky.
The flock split into three, with $^{1}/_{3}$ of the birds flying off to the left, $^{2}/_{9}$ of them flying off to the right and the remainder going straight ahead.
What fraction of the birds flew straight ahead?

working-out and answer space

2 The Smiths are setting off on a hike that they expect to last a week. Mr Smith is carrying $^{2}/_{5}$ of their week's food supply in his backpack, Mrs Smith is carrying $^{4}/_{15}$ of their food supply and Junior Smith is carrying the rest of their food. What fraction of the Smith's food supply is Junior Smith carrying?

working-out and answer space

3 Betty Beachgirl made a sandcastle of three levels. The first level was $^{5}/_{18}$ the height of the whole castle (not including the flag). The height from the bottom of the castle to the top of the second level was $^{13}/_{18}$ the height of the whole castle. What fraction of the castle's height was the second level by itself?

working-out and answer space

4 What fraction of Betty's castle's height was the top level by itself?

working-out and answer space

5 What fraction of Betty's castle's height was the top two levels added together?

working-out and answer space

6 Skiing holidays are Tom's favourites. Yesterday he spent $^{1}/_{4}$ of his skiing time on the Giant Slalom and $^{5}/_{12}$ of his skiing time skiing cross country. What fraction of Tom's skiing time was spent on the Giant Slalom and skiing cross country?

working-out and answer space

7 Tom the skier is saving up for a new pair of skis. In January he saved $^{3}/_{8}$ of the amount he needs and in February he saved $^{5}/_{16}$ of the amount required. What fraction of the cost of the new skis does Tom still need to save?

working-out and answer space

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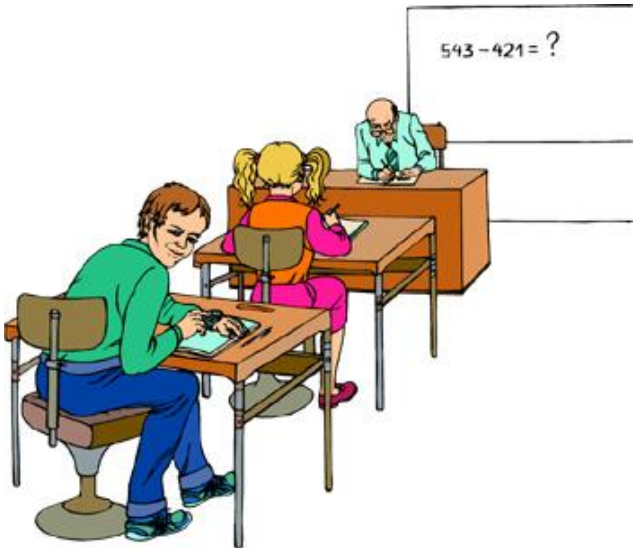
In Class



1 In the picture on the left is Jamie, a student who is very good at Maths. In Monday's Maths test, which consisted of Part A and Part B, Jamie did well in Part A and even better in Part B. In Part A Jamie got 10 out of 12 questions correct. In Part B he got 18 out of 20 questions correct.
What fraction of the whole test did Jamie get correct?

working-out and answer space

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2 What fraction of the test did Jamie get incorrect?

working-out and answer space

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3 Oh no, Charlie the Cheat is up to his old tricks, peering over Oliver's shoulder to see his answers! Oliver got $^{3}/_{4}$ of the Maths test answers correct while Charlie got $^{2}/_{3}$ of them correct. By what fraction of the test did Oliver outscore Charlie?

working-out and answer space

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4 Oliver does better in English tests than in Maths tests. As we know, he got $^{3}/_{4}$ of the Maths test correct. In the English test he did very well indeed, getting $^{8}/_{9}$ of the answers right. By what fraction did Oliver's English test result exceed his Maths test result?

working-out and answer space

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5 Michael and Rosie were doing a project on Japan and searched the WWW for information. When they completed their research they worked out that Michael was responsible for $^{5}/_{8}$ of the information they acquired, Rosie's share was $^{1}/_{3}$ and their teacher provided them with the rest. What fraction of their project information was provided by their teacher?

working-out and answer space

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6 What is the difference between Michael's and Rosie's fractions of the information they found?

working-out and answer space →

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Sleepover

1 Josie stayed at her friend Alice's house for the weekend. On Saturday afternoon they went to the park and in the evening they watched DVDs. The two friends spent $^{1}/_{10}$ of Saturday at the park and $^{1}/_{8}$ of Saturday watching DVDs. What fraction of Saturday did Josie and Alice spend at the park and watching DVDs?

working-out and answer space

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2 When the Miller children slept over at the Smith's they spent $^{2}/_{5}$ of the time in Ruth's room and $^{1}/_{6}$ of the time in Danny's room. What fraction of the time was spent in Ruth's and Danny's rooms?

working-out and answer space

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3 What fraction of the time was <u>not</u> spent in Ruth's and Danny's rooms?

working-out and answer space

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4 Ruth and Danny have an aquarium in their living room. Ruth feeds the fish $^{1}/_{3}$ of the time, Danny feeds them $^{1}/_{5}$ of the time and their father, Mr Smith, feeds them the rest of the time. What fraction of the times that the fish are fed is taken up by Ruth and her father feeding them?

working-out and answer space

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5 James and Ricky are scouts. One night they slept in a tent in Ricky's backyard. Before going to sleep the boys used a torch to read one of their scouting books. Ricky read $^{1}/_{4}$ of the book and then James read another $^{2}/_{5}$ of the book. What fraction of the book did the boys read?

working-out and answer space

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6 What fraction of the book did the boys not read?

working-out and answer space →

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Families

1 Today the Johnson family went on their morning walk. Little Emma walked a total of 2.6 km (she and Mrs Johnson went home early). Emma's older brother Kane walked 6.1 km with his father. How many kilometres, combined, did Emma and Kane walk?

working-out and answer space

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2 How much less than Kane did Emma walk?

working-out and answer space

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3 How much is double the distance that Emma walked?

working-out and answer space

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4 Mr Samuels is 1.82m tall and his son Peter is 1.53m. How much taller than Peter is Mr Samuels?

working-out and answer space

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5 Julie Samuels, Peter's sister is 1.58m tall. Her mother is 13cm taller than her. How tall is Mrs Samuels?

working-out and answer space

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6 What is the combined height of the Samuels family?

working-out and answer space

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7 This scary Bat family is off to a Fancy Dress Party. Mrs Bat, Mr Bat and Junior Bat are carrying bat-shaped lollies in their pockets (to give to other party-goers). Of all the lollies they're carrying Mrs Bat has 0.5 of them while Junior's share is 0.2. What is Mr Bat's decimal share of the lollies?

working-out and answer space

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8 The family is carrying 20 lollies altogether. How many lollies is each person carrying?

working-out space ◄

Mrs Bat ▼ *Mr Bat* ▼ *Junior Bat* ▼

9 The family on the right are out canoeing. Dad rows for 0.5 of the time, Mum for 0.3 of the time and Junior for the rest of the time. For what decimal of the time does Junior row?

working-out and answer space ►

10 If Dad's 0.5 equals 60 minutes how long does Junior row for?

working-out and answer space ►

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Friends

1 Three friends, Alice, Sue and Vanessa, are looking at photos of themselves when they were babies.
"Hey, look at this one," says Alice, "this is me when I was 9 months old and I was only 0.25 of the height that I am now."
How tall was baby Alice if she's 1.6m now?
working-out and answer space

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2 The friends at the table are talking about their best Lotto wins.
Mary says, "The most I ever won was $110."
"My best win was just 0.4 of yours," says Jake.
"I had a good win," adds Charlie, "it was 0.9 of your best Mary."
What were Jake and Charlie's best wins?

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3 Below is Ginger and Floppy. Ginger enjoys lying on Floppy's back and he does that for about 0.1 of each day. How long is that, in hours? *working-out and answer space*

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4 Benny, Josh and William, at left, are saving their pocket money to buy a go-cart. The go-cart costs $200 and so far the boys have saved 0.4 of that amount. How much money do they still need? *working-out and answer space*

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5 The two pals at right are Kev and Thomas, both of whom love to go hang gliding. Kev would like to glide for one hour without a break but his best so far is 0.7 hours.
How many minutes is that?
working-out and answer space

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6 Thomas the hang glider once glided from Clifftop to Shelly Beach, a distance of 2km, but his last glide was just 0.6 of that distance. How far did Thomas go on his last glide?
working-out and answer space

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Party Fun

1 There's a party on tomorrow. All those invited will pay $2.75 at the door to cover drinks and nibbles. 9 people are invited. How much money will be paid altogether for drinks and nibbles?

working-out and answer space

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2 Of the $2.75 paid for drinks and nibbles, $1.15 covers drinks. How much will all 9 partygoers pay just for the drinks?

working-out and answer space

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3 These 12 and 13 year olds are at a fancy dress party. One of them, Jason, paid $40.60 to hire his costume for a week. How much does that come to per day?

working-out and answer space

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4 The hall where the fancy dress party was held cost $91.00 to hire out. 70 people attended the party. How much, on average, did the hall hire cost per partygoer?

working-out and answer space

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5 The three astronauts are in party mood, celebrating 100 days in Space. Each of their spacesuits weighs 24.8kg (on Earth). How much do the three spacesuits weigh altogether?

working-out and answer space

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6 Inside their space capsule each of the three astronauts consumes 19.5 litres of oxygen per hour. How much oxygen do they consume altogether per hour?

working-out and answer space

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7 Dancing at the party (at right) went on most of the afternoon. 4 different CDs were played, lasting an average 35.5 minutes. For how many hours and minutes did the CD music play?

working-out and answer space

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8 Sally danced 9 times and totalled 44.1 minutes on the dance floor. What was her average number of minutes per dance?

working-out and answer space

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At the Beach

1 The temperature reached 30° when Lotta was at the beach with her mother. It was even hotter than Lotta's Mum thought... she guessed the temperature got to 0.9 of what it did reach. What was Lotta's mother's guess at the temperature?

working-out and answer space

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2 Lotta's mother ate 0.57 of their watermelon and Lotta had the remainder. What decimal of the watermelon did Lotta eat?

working-out and answer space

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3 There were 30 beach umbrellas on the beach. 0.2 of them had just one colour and the rest were multi-coloured. How many umbrellas had more than one colour?

working-out and answer space

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4 0.3 of the 30 umbrellas had wooden (not metal) poles. How many of the umbrellas did not have wooden poles?

working-out and answer space

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5 Jack and his Dad enjoyed playing with a football at the beach. Jack's Dad threw the football to Jack 40 times and Jack caught 0.7 of the throws. How many catches did Jack take?

working-out and answer space

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6 Adam called out to his friend Tony, who was swimming 200m off the beach. Adam called Tony's name 5 times but Tony didn't hear Adam 0.8 of those 5 times. How many times did Tony hear Adam calling him?

working-out and answer space

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7 After applying sun cream Sue the sunbather sunbaked for 1 hour. For 0.6 of that hour Sue was lying on her back and for the rest of the time she lay on her stomach. For how many minutes was Sue lying on her stomach?

working-out and answer space

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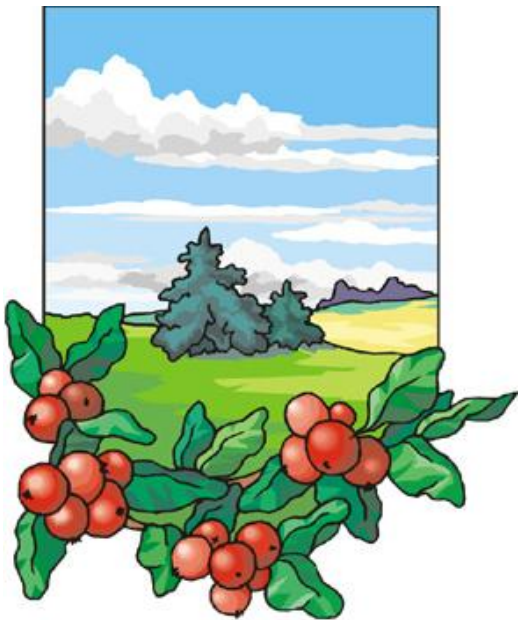
On the Farm



1 Andy the apple grower sells apples for $2.80 per kilogram.
Mrs Jones bought 5.5kg of apples from Andy. How much did Mrs Jones pay?
working-out and answer space

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2 How much would Mrs Jones have paid if Andy's price had been $2.70 per kilogram?
working-out and answer space

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3 Andy packs some of his apples in bags and takes them by truck to sell at the market. If each bag weighs 0.025 tonnes and Andy's truck can carry a 2.5 tonne (maximum) load how many bags of apples may be carried in one truckload?
working-out and answer space

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4 Farmer Brown is moving bales of hay with his tractor. Each bale weighs 0.15 tonnes and there are 5 bales per tractor load. How many tonnes of hay does Farmer Brown move with four tractor loads?
working-out and answer space

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5 In the past 4 weeks Mabel the cow has produced 434.8L of milk.
How much milk, on average, is this per week?
working-out and answer space

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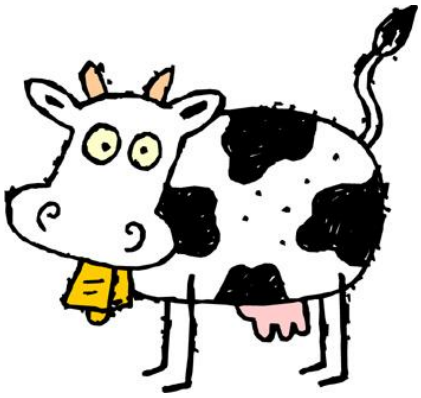

6 Bessy the cow produced 0.7 of Mabel's amount of milk in the 4 weeks.
How much milk did Bessy produce?
working-out and answer space

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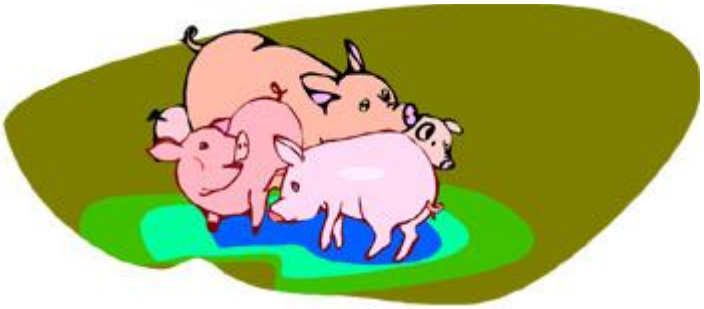

7 Each pig weighs, on average, 0.09 tonnes. There are 4 pigs. What is 0.8 of their combined weight, in kg?
working-out and answer space

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8 Six new-born piglets had a combined weight of 7.2 kg. How much, in grams, is 0.1 of the average weight of one of the piglets? *working-out and answer space*

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Collections

1 Sarah sold her shell collection for an average of $2.50 per shell. There were 52 shells in the collection. How much money did she receive from the sale?

working-out and answer space

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2 Sarah expected to receive only $1.90 per shell. How much money did she expect to receive from the sale?

working-out and answer space

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3 Mary-Lou collects teddy bears. Her biggest bear, Ted, is 0.35m in height. Mary-Lou's second biggest bear is Yogi who is 0.8 the height of Ted. How many cm tall is Yogi?

working-out and answer space

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4 The smallest bear in Mary-Lou's collection is Tiny who is just 0.25 Yogi's height. What is the difference in height between Ted and Tiny?

working-out and answer space

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5 Brianna collects books of her favourite authors. Her biggest book, *The Silver Stallion*, has 350 pages and her smallest book, *Enchanted Valley*, has just 0.4 of *The Silver Stallion's* pages. How many pages does *Enchanted Valley* have?

working-out and answer space

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6 Brianna added together the number of pages in *The Silver Stallion* and *Enchanted Valley.* What is 1.5 times that number?

working-out and answer space

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7 Raymond collects coins of the world and he keeps them in a bag. At the end of January the bag weighed 1.5kg. At the end of July it weighed 1.2 times the January amount. How many grams did the bag weigh at the end of July?

working-out and answer space

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8 Raymond sold some of his coins in August and at the end of that month his bag of coins weighed 0.8 the July weight. How many grams is that?

working-out and answer space ➔

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Relatives

1 Matt and his Grandpa are at the nursery buying pot plants. Grandpa says to Matt, "I had a plant like this once before and it was meant to grow to a height of one metre; however it grew to just 70% of that."
To what height did that plant of grandpa's grow?

working-out and answer space

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2 How much taller would grandpa's plant have been if it had grown to 95% of its expected height?

working-out and answer space

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3 Anthony, Lisa and their baby daughter Sharnie are visiting Grandma. Grandma thinks it's 10 weeks since they've visited her but Anthony says, "No, it's only 70% of that." (and he was correct)
How many days is it since the family visited Grandma?

working-out and answer space

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4 Lisa is 90% of Anthony's age. Anthony is 30. How old is Lisa?

working-out and answer space

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Slim Uncle Bob

5 Joey and his sister Emma have gone with their parents to visit Uncle Bob. Uncle Bob used to weigh 90kg but he went on a diet and now weighs 80% of his former weight. How much weight did Uncle Bob lose?

working-out and answer space

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6 Uncle Bob says he spends much less money on food now. He used to spend $200 a week but has reduced this amount by 30%. What is Uncle Bob's weekly food bill now?

working-out and answer space

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7 It's a family reunion and it's been a long time Jess saw her Grandmother. Gran is now 70 and Jess is 40% of Gran's age. How old is Jess?

working-out and answer space

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8 Jess's husband Alf is 50% of Grandpa's age. Grandpa is 72.
How much older than Jess is Alf?

working-out and answer space

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Reading

1 Annie loves to read newspapers. In fact she reads every word on every page! She's now 70% of the way through page 3 which contains 600 words. Has many words does Annie still have to read on page 3?

working-out and answer space

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2 Annie's sister Lou-Lou enjoys reading the newspaper after Annie but she only reads 25% of the words that Annie reads. How many words will Lou-Lou read on page 3?

working-out and answer space

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3 Brian the balancer enjoys two things....reading and balancing. Brian knows that his reading speed while balancing is 90% of his reading speed when not balancing. If he reads 200 words per minute when not balancing how many words will he read in one minute while balancing?

working-out and answer space

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4 Last week Brian wasn't feeling too well and his reading speed dropped to just 60% of his normal rate. How many words per minute could Brian read last week while balancing?

working-out and answer space

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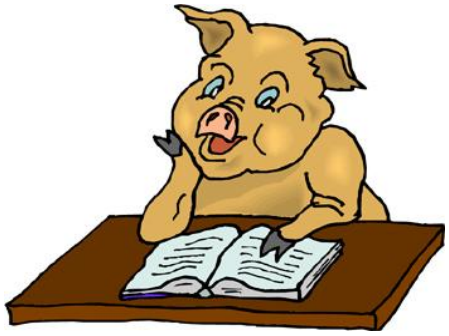

5 Pixie Pig is a good reader and, of course, her favourite story is *The Three Little Pigs* which she reads over and over again. Pixie is 30% of the way through the story, which contains 900 words. How many words does Pixie have left to read?

working-out and answer space

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6 The librarian is helping Jane select a book for her project research on India. The article Jane will use contains 800 words but Jane will use just 60% of those. How many words in the India article will Jane not use?

working-out and answer space

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7 Jane's teacher gives the class a test on India. There are 40 questions and Jane's score is 90%. How many questions did Jane get correct?

working-out and answer space

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Time to Sleep

1 Lazy Larry should have been outside mowing the lawn but chose instead to take a nap. Larry overslept and didn't leave himself enough time to complete all of the lawn mowing before the sun went down. Larry has 200m^2 of lawn area but he was only able to mow 75% of it before the sun set. How many square metres of his lawn did Larry mow?

working-out and answer space

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2 Larry has a pergola in his back yard. The paved area covered by the pergola is just 8% of Larry's lawn area. How much is that?

working-out and answer space

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3 Tiger the cat loves to sleep in front of the open fire. Tiger sleeps on a bean bag which is just the right size for him. The bean bag is 40cm in length and Tiger's length (not including his tail) is 90% of that. How long is Tiger?

working-out and answer space

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4 The bean bag's width is 85% of its length. How wide is it?

working-out and answer space

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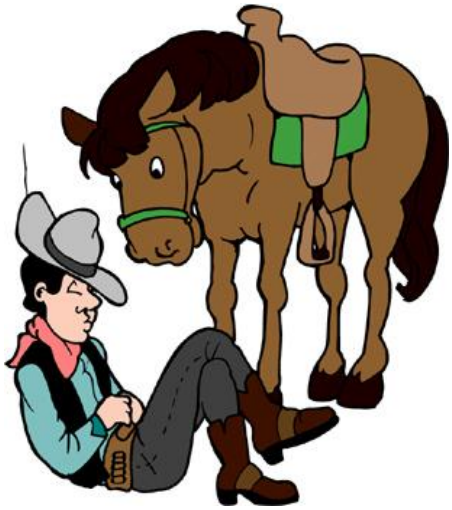

5 Drowsy Dan is a cowboy who enjoys a little sleep a few times during the day. This can be a problem because Dan doesn't get to fix all the fences he should. Yesterday 15% of the 300 head of cattle on the cattle station where Dan is employed escaped through the broken fence. How many cattle did not escape?

working-out and answer space

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6 The cattle station is surrounded by 50km of fencing of which 1% needs repairs. How much (in km) of the fencing is in good condition?

working-out and answer space

.....

7 Oh, what a life! As well as his night time sleep Fido sleeps for 75% of the time between 7am and 5pm. For how many hours and minutes does Fido sleep between those hours?

working-out and answer space

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At the Shops

1 Mrs Maxwell got some amazing bargains at the Storewide Sale. She bought a dress, usually $90, for just 35% of that price. How much did she pay?

working-out and answer space

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2 Another bargain for Mrs Maxwell was a hat marked at $29. She bought it for 70% less than the marked price. How much did the hat cost Mrs Maxwell?

working-out and answer space

3 Barry the bachelor does all of his grocery shopping on Thursday afternoons. Last Thursday he went into the supermarket with $90 and came out with just 10% of that amount. How much did Barry spend on groceries?

working-out and answer space

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4 A month ago Barry had a huge grocery bill because he hosted a party for 25 invited guests. Of the 25 people who came to Barry's house 20% came on foot (they were neighbours) and another 20% came by tram. How many of Barry's guests did not come on foot or by tram?

working-out and answer space

5 This shopping trolley has a depth of 70cm. The groceries in it are using up 80% of that depth. How many cm is it between the top of the groceries and the top of the trolley?

working-out and answer space

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6 Of the supermarket's 220 shopping trolleys 5% are slightly damaged and the remainder are in good condition. How many of the trolleys are in good condition?

working-out and answer space

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7 Mrs Lindsay usually shops for 5 hours every week. This week she only shopped for 85% of her usual time. For how many hours and minutes did Mrs Lindsay shop this week?

working-out and answer space

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8 80% of Mrs Lindsay's shopping time this week was in the supermarket. How many hours did she spend in the supermarket this week? ↙*working-out and answer space*

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In the City

1 Constable Parker enjoys directing traffic in the city. One blow of his whistle usually lasts 1.5 seconds. Sometimes he gives a short, sharp blow which sounds for just 80% of the usual time. For how long does Constable Parker's whistle sound with these shorter blows?

working-out and answer space

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2 Sometimes a driver or pedestrian will do something silly and Constable Parker needs to blow his whistle for longer than the usual time. The longest his whistle has sounded is 140% of the usual time. How long is that?

working-out and answer space

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3 During rush hour in the city -between 5pm and 6pm- 75 red cars were counted. Between 6pm and 7pm there were just 60% of that number. How many more red cars were there in rush hour than between 6pm and 7pm?

working-out and answer space

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4 Motor cycles, cars and trucks.....three different kinds of vehicles. Last Tuesday between 10am and 11am 40 trucks passed through the traffic lights. There were 80% as many motor cycles as trucks. How many motor cycles passed through?

working-out and answer space

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5 There were 500% as many cars as trucks. How many cars were there?

working-out and answer space

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6 Lakeside City's buildings are much taller today than they were 10 years ago. The tallest building today is 250m. 10 years ago the tallest building in Lakeside City was 70% of that height. How much higher is Lakeside City's tallest building than the one that was tallest 10 years ago?

working-out and answer space

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7 Lakeside City's population is also growing.
10 years ago there were 1.5 million people who lived in Lakeside City's metropolitan area. Now there is 120% of that number.
What is Lakeside City's population now?

working-out and answer space

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The Weekend

1 The Robbins family like to go for picnics. This Sunday they plan on going to Pine Clearing. As the road to Pine Clearing has just been widened Mr Robbins estimates that travelling time (one way) will be just 70% of the 2.5 hours that it used to be. How many minutes does Mr Robbins expect the trip to take now?

working-out and answer space

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2 Half way to Pine Clearing the Robbins family encountered road works (seems that work on the widened road was not quite finished) and the trip took 120% of the 2.5 hours. How much longer than Mr Robbins' quicker estimate did the trip take? *working-out and answer space*

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3 On Saturday afternoons Charlie loves to go riding on his mountain bike. Last week Charlie completed a 35km ride. This Saturday he plans to ride 140% of that distance. How long will Charlie's ride be this Saturday?

working-out and answer space

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4 Charlie's best time for a 35km ride is 2 hours. With a new bike he soon hopes to complete the distance in 75% of that time. How many minutes will Charlie cut off his best time if he is successful?

working-out and answer space

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5 The Jones and Lawson families go sailing together every weekend in summer.
The Jones' boat is 5m long. The Lawsons' boat is 85% as long as the boat belonging to the Jones family. How long -in metres and centimetres- is the Lawsons' boat?

working-out and answer space

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6 The Lawsons are getting a new boat soon and it will be 120% as long as the Jones' boat. How long is that?

working-out and answer space

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7 The Simpsons went camping on 20 weekends in 2006 and it rained on 35% of those weekends. How many of the weekends were dry?

working-out and answer space

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8 On one Sunday the Simpsons caught 5 dozen fish but only 70% of them were edible. How many of the fish were inedible? *working-out and answer space*

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Around the House

1 This little cottage has just been painted.
25% of the paint used was brown and 0.2 of the paint was red.
What fraction of the paint used was not brown or red?

working-out and answer space

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2 What fraction of the paint was not red?

working-out and answer space

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3 Gary the gardener prunes his flowers once a year and it takes him two hours. 0.25 of the time spent pruning is in the garden at the front, $^1/_5$ of the time is spent in the garden along the side and the rest of the time is spent in the garden. How long, in hours and minutes, does Gary spend pruning in the back garden?

working-out and answer space

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4 This is Gary the gardener's front gate. This week, 40 people passed through the gate and of those, 0.3 of them were strangers who came to see Gary's prize-winning garden, $^1/_{20}$ of them were Gary's friends and the rest of the gate users were Gary and his family. What percentage of the gate users were made up of Gary and his family?

working-out and answer space

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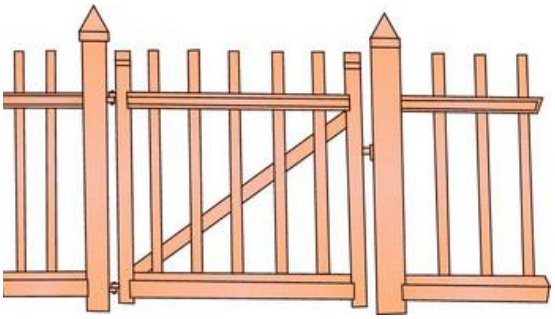

5 Gary spent 4 hours in his garden yesterday. He was watering plants for $^1/_8$ of that time and digging for 20% of the time. The rest of the 4 hours was spent using a trowel. For how many hours and minutes was Gary using a trowel?

working-out and answer space

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6 For what percentage of the 4 hours was Gary using a trowel?

working-out and answer space

7 For what fraction of the 4 hours was Gary **not** digging? *working-out and answer space*

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Saving Up

1 The Adams family is saving to go to Disneyland in the USA. By the end of March they had saved half of their fares, by the end of June they had saved 0.6 of their fares and by the end of September they had saved $^3/_4$ of their fares.
At the end of September what percentage of their fares did they still have to save?

working-out and answer space

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2 The total of the Adams' fares is $12 000. How much of this was saved between the end of June and the end of September? *working-out and answer space*

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3 Johnny enjoys bushwalking, especially in the high mountain country. Johnny has been saving for a pair of snow boots which cost $400, and he has saved 0.7 of the money he needs for them. How much more money does Johnny need to save?

working-out and answer space

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4 How much is $^3/_4$ of the amount that Johnny has already saved?

working-out and answer space

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5 Russ is saving for a new bike. The bike Russ plans to buy costs $360 and so far Russ has saved 0.3 of that amount. As a birthday present Russ's auntie gives him 50% of the amount he still needs. How much will Russ still have to save before he can purchase the bike?

working-out and answer space

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6 How much of the $360 will Russ eventually contribute towards the bike?

working-out and answer space

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7 Samantha has always wanted a pony of her own. She's saving very hard to buy one and knows she'll need around $500 to get one she really likes. Over summer she saved 30% of the $500, in autumn she saved another 0.4 of the total and during winter she saved $^1/_5$ of the $500. It is now the first day of spring. What percentage of the total does Samantha still need to save?

working-out and answer space

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8 How much money did Samantha save during autumn?

working-out and answer space

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Pets

1 This is Rascal. Rascal was one of a litter of 8 puppies. $^{3}/_{4}$ of the litter had some black on their ears and of these $^{2}/_{3}$ had white on at least one paw. What percentage of puppies in the litter did not have black on their ears and white on at least one paw?

working-out and answer space

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2 On Sunday Rascal slept for 0.6 of the time between 7am and 5pm. For how many hours between 7am and 5pm was Rascal awake?

working-out and answer space

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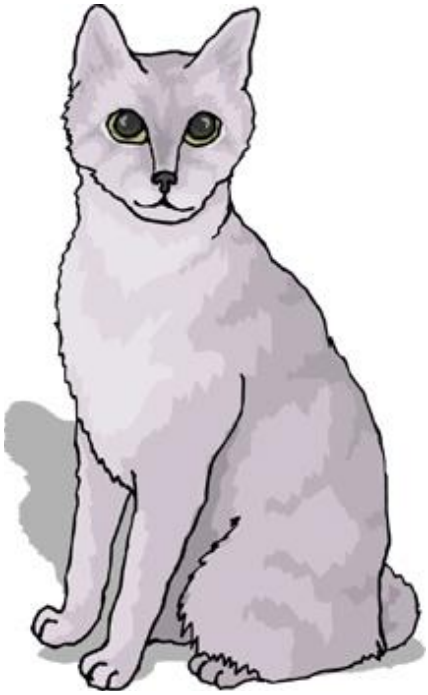
Meet Puss, a young cat who really does seem to have nine lives. Already in her short life Puss has had eight 'close shaves'. Three times she was almost run over by a car, twice she was nearly skittled by a motorbike, once she just managed to outrun a fast advancing bull terrier and twice she survived a freezing night after accidentally being shut outside.



3 What percentage of Puss's lucky escapes have involved another animal?

working-out and answer space

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4 What fraction of Puss's close shaves involved a vehicle?

working-out and answer space

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5 What decimal of Puss's escapes did **not** involve a vehicle or another animal?

working-out and answer space

.....

6 Over three days last week Alice closely observed her two goldfish, Fantail and Zeeta, to see which of them swims higher than the other. From Monday to Wednesday Alice made 10 observations daily. On Monday Zeeta swam higher than Fantail in 8 of Alice's 10 observations. On Tuesday it was Zeeta again....6 out of 10 times. On Wednesday Zeeta swam higher than Fantail 7 out of 10 times.
What decimal of all of Alice's observations was Fantail **not** swimming below Zeeta?

working-out and answer space

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7 Sometimes Fluffy the rabbit sleeps in a basket, at other times on a cushion and the rest of the time in her hutch. For her last 40 sleeps Fluffy has slept in her hutch $^{1}/_{5}$ of the time and on a cushion 40% of the time.
How many times did Fluffy sleep in the basket?

working-out and answer space

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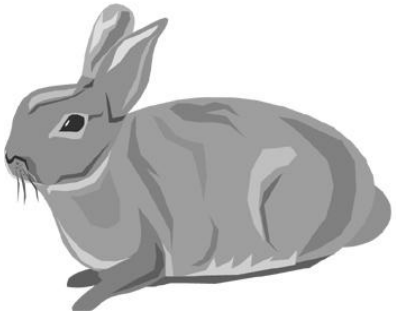

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In the Snow Country

1 Tim and Tammy have great fun tobogganing down the slopes. Once they tobogganed down a 350m slope, going over 40 bumps along the way.
The biggest bump was 80% of the way down the slope.
How far from the lower end of the slope was this big bump?

working-out and answer space

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2 Only after going over $^{5}/_{8}$ of the bumps did Tammy start to relax (she even began to laugh out loud). How many bumps remained at that point?

working-out and answer space

.....

3 Sometimes Tim sits at the front and at other times it's Tammy. The last time they went tobogganing Tim sat at the front on 0.7 of their 20 rides. For what fraction of the rides did Tammy sit at the front?

working-out and answer space

.....

4 Jane and her brother Jack, working separately, built this snowman which took 1½ hours to assemble. Jane worked for 0.6 of the time and Jack the remainder.
For what fraction of that 1½ hours did Jack work on the snowman?

working-out and answer space

.....

5 For how many minutes did Jane work on the snowman?

working-out and answer space

.....

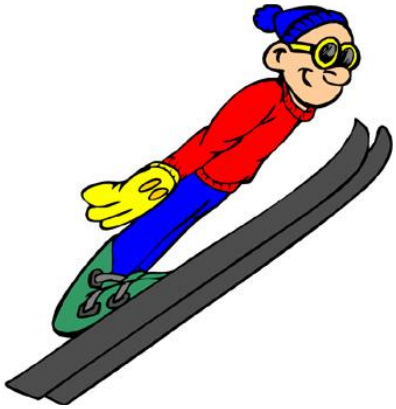
6 This mountain hut has $^{7}/_{8}$ of its roof covered with snow.
What decimal of its roof is **not** covered with snow?

working-out and answer space

.....

7 Beanie Bob is trying to beat his longest ever ski jump of 150m.
Unfortunately this attempt fails and Beanie Bob jumps just 90% of his best distance.
By how many metres did Beanie Bob fall short of his best ever jump?

working-out and answer space



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8 One day Beanie Bob would like to do a jump that is 1.2 times the distance of his 150m best jump. If successful by how much would BB exceed his old record?

working-out and answer space

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In the Library

1 Of the 4 500 books in the school library $^{1}/_{3}$ are fiction and the rest are non fiction. How many books are non fiction?

working-out and answer space

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2 0.8 of the fiction books are illustrated.
How many fiction books do **not** have illustrations?

working-out and answer space

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3 Simon used three resource books for his research on The Great Wall of China. He got all the information he needed -100%- from the books. One book gave him 0.4 of his information and another gave him 25% of his information. What fraction of the information that Simon obtained came from the 3rd book?

working-out and answer space

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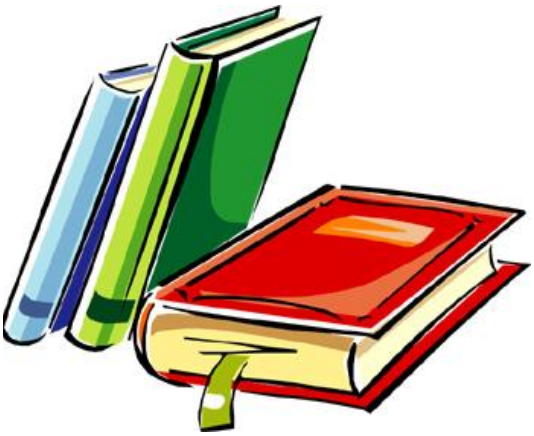

4 What fraction of Simon's information came from the first two books?

working-out and answer space

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5 Ms Smith is the school librarian and she's been at the school for 16 years. For the first $^{3}/_{8}$ of that time she had an assistant to help her with library duties. For how many years has Ms Smith worked without an assistant?

working-out and answer space

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6 Yesterday Ms Smith purchased some new books for the library. 45% of these were written by Australian authors, 0.2 by British authors and the remainder by authors from other countries.
What fraction of the new books were written by authors who are neither Australian nor British?

working-out and answer space

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7 Shannon enjoys going to the school library on Mondays and Wednesdays to read about her favourite bird, the pelican. Last Monday Shannon spent 30 minutes reading about pelicans and on Wednesday she read for $^{4}/_{5}$ of the amount of time she did on Monday.
How many minutes did Shannon spend reading about pelicans over the two days?

working-out and answer space

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Sport

1 Brad Donman is a champion cricketer who scores lots and lots of runs. Last season he made several centuries and his fastest century, when he scored exactly 100 runs, included 17 fours and 4 sixes.
What fraction of Brad's 100 runs came from fours?

working-out and answer space

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2 What decimal of Brad's runs did **not** come from fours and sixes?

working-out and answer space

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3 Over the past three years Rita the rhythmic gymnast has entered 16 competitions.
She came 1st in six of them, 2nd in four, 3rd in four and 4th in the other two.
Rita finished 1st, 2nd or 3rd in what decimal of the competitions?

working-out and answer space

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4 In what percentage of the competitions did Rita **not** finish in the first three placegetters?

working-out and answer space

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5 Danny weighed his soccer ball and then he weighed one of his shoes. The ball weighed 400g and the shoe weighed 0.75 of the ball's weight. How many shoes would weigh as much as three soccer balls?

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6 Danny also weighed his cricket bat and found that it weighed $^{5}/_{6}$ as much as 3 soccer balls. How much did the bat weigh?

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7 Rebecca loves to play tennis. In her last match she served 15 aces. 10 of those aces were served to her opponent's backhand and the others to her opponent's forehand.
What fraction of Rebecca's aces were served to her opponent's forehand?

working-out and answer space

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8 In her 2nd last match Rebecca served 6 aces.
What percentage of the 15 aces she served in her last match is this?

working-out and answer space

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Answers

Question numbers ➔	1	2	3	4	5	6	7	8	9	10
Out and About *p5*	15	3m	14	40	350	$100				
At the Movies *p6*	6	30m	$14	60	44					
Computer Stories *p7*	$^5/_6$	$^1/_2$	$^5/_8$	$^1/_4$						
Holidays *p8*	$^4/_9$	$^1/_3$	$^4/_9$	$^5/_{18}$	$^{13}/_{18}$	$^2/_3$	$^5/_{16}$			
In Class *p9*	$^7/_8$	$^1/_8$	$^1/_{12}$	$^5/_{36}$	$^1/_{24}$	$^7/_{24}$				
Sleepover *p10*	$^9/_{40}$	$^{17}/_{30}$	$^{13}/_{30}$	$^4/_5$	$^{13}/_{20}$	$^7/_{20}$				
Families *p11*	8.7	3.5km	5.2km	0.29m	1.71m	6.64m	0.3	10,6,4	0.2	24m
Friends *p12*	40cm	$44,$99	2.4	$120	42	1.2km				
Party Fun *p13*	$24.75	$10.35	$5.80	$1.30	74.4 kg	58.5L	2h22m	4.9		
At the Beach *p14*	27°	0.43	24	21	28	1	24			
On the Farm *p15*	$15.40	$14.85	100	3	108.7L	304.36L	288 kg	120 g		
Collections *p16*	$130	$98.80	28	28 cm	140	735	1 800	1 440		
Relatives *p17*	70 cm	25 cm	49	27	18 kg	$140	28	8 yrs		
Reading *p18*	180	150	180	108	630	320	36			
Time to Sleep *p19*	$150m^2$	$16m^2$	36 cm	34 cm	255	49.5km	7h30m			
At the Shops *p20*	$31.50	$8.70	$81	15	14	209	4h15m	3.4		
In the City *p21*	1.2 s	2.1 s	30	32	200	75m	1.8 mil			
The Weekend *p22*	105	75 min	49 km	30	4m25cm	6m	13	18		
Around the House *p23*	$^{11}/_{20}$	$^4/_5$	1h 6m	65%	2hr42m	67.5%	$^4/_5$			
Saving Up *p24*	25%	$1 800	$120	$210	$126	$234	10%	$200		
Pets *p25*	50%	4	12.5%	$^5/_8$	0.25	0.3	16			
In the Snow Country *p26*	70m	15	$^3/_{10}$	$^2/_5$	54	0.125	15	30m		
In the Library *p27*	3 000	300	$^7/_{20}$	$^{13}/_{20}$	10	$^7/_{20}$	54			
Sport *p28*	$^{17}/_{25}$	0.08	0.875	12.5%	4	1 kg	$^1/_3$	40%		

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