

Technology Exploration Word



Equipment required: 1 brain, Microsoft® Word® 2010 (with free Mathematics add-in) or CAS/scientific calculator

The evil genie and the curse of the infinite fraction

Once upon a time, there were two ladybirds that were very much in love. One day in an antique store, one of them crawled onto a lamp. With a puff of smoke, a genie appeared. The genie roared "Ha, ha, ha, I am an evil genie. You are currently 1 metre apart. For waking me up I curse you with the following rules: You will only be able to move once per day towards your love, and each day you will only be able to travel half of the distance remaining between you and your love. Your love may not step towards you". The genie then disappeared.



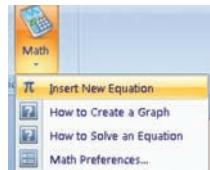
Were the loving ladybirds ever able to be together again?

On the first day, one of the ladybirds could travel half a metre forward, then on the next day a quarter of a metre, then an eighth of a metre on the third day.

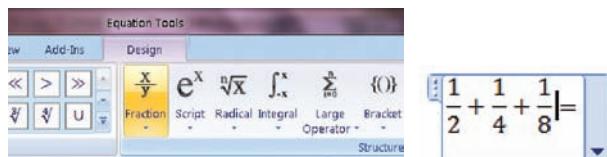
The total distance travelled by the ladybird in the first 3 days is represented by the following addition: $\frac{1}{2} + \frac{1}{4} + \frac{1}{8}$.

- 1 Enter the above expression into Word 2010.

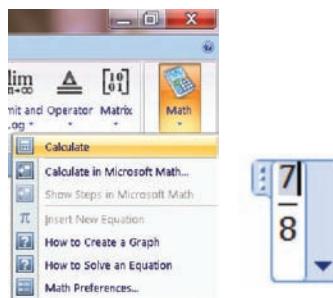
Step 1: Select Math from the Add-Ins menu. A drop-down menu will appear; select 'Insert New Equation'.



Step 2: Select the Fraction template from the Design ('Equation Tools') menu and enter the necessary fractions.



Step 3: To calculate the answer, select Math> Calculate, and the answer should appear.





- 2 Explore the distance travelled by the ladybird by copying and pasting the previous fraction sum, and adding the next fraction in the series.
- (a) What distance does it travel in:
- (i) the first 5 days
 - (ii) the first 7 days
 - (iii) the first 11 days?
- (b) At this stage, does it look like the distance between the ladybirds will ever be zero?
- 3 Consider the distances travelled over the first 3, 5, 7 and 11 days. What value are your results getting closer to?
- 4 To help you visualise the pattern, you can construct a diagram.

Draw a long rectangle to represent the distance between the ladybirds.

Shade in half of the rectangle to represent the distance travelled on the first day, and label it with $\frac{1}{2}$.



Shade in half of the unshaded portion of the rectangle to represent the distance travelled on the second day. Label this $\frac{1}{4}$.



Continue to shade the rectangle according to the pattern.



Continue this process as far as you can.



- 5 From your diagram, you can see that you are getting closer and closer to shading in the whole rectangle. If you were able to zoom in and continue shading forever, would you ever be able to shade the entire rectangle? Explain your answer.
- 6 Will the distance between the ladybirds ever be zero? Explain why or why not.

- 7 Would the situation be different if the ladybirds had started closer together or further apart? Use an example to help you explain.

You considered the problem by calculating distances (in Questions 1–3) and the same problem as a diagram (in Questions 4, 5). Which of these methods gave you a better ‘sense’ of the problem? Explain why.

Taking it further

- 8 When you add together the numbers in a pattern such as this, it is called a series. As you add together more and more terms, you may notice that the series gets closer and closer to a particular value. Series like these are called ‘convergent series’. Sometimes, when you add together more and more terms, you may notice that the value just gets larger and larger. Series like these are called ‘divergent series’.

- (a) For the ladybird problem, did it seem to be a convergent or a divergent series?
(b) For each of the following series:

write down the next two terms in the series.

Use the Word Mathematics add-in to help you calculate the sum of the series for as many terms as you can.

State whether you think the following series will be convergent or divergent. Explain your answer.

- (i) $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} \dots$
- (ii) $\frac{1}{2} + \frac{1}{6} + \frac{1}{18} + \frac{1}{54} \dots$
- (iii) $\frac{2}{3} + \frac{3}{4} + \frac{4}{5} \dots$
- (iv) $\frac{1}{2} - \frac{1}{4} + \frac{1}{8} - \frac{1}{16} \dots$

- (c) In English, what does it mean when people say there was ‘divergent opinion’ about something? How is this similar to what you know about divergent series?

3.7

Mixed fraction problems

Fractions and the order of operations

The order of operations rules that apply to whole numbers also apply to fractions.

The first step in any calculation is to complete any operation within brackets. The next step is to do any multiplication or division as you come to it, working from left to right. Then, do addition or subtraction as you come to it, working from left to right.

Worked Example 19

WE19

Simplify the following using the correct order of operations.

(a) $3 + \frac{2}{5} \times \frac{1}{2}$

(b) $\frac{6}{7} \times \left(1\frac{2}{3} + \frac{1}{4}\right) - \frac{3}{7}$

Thinking

- (a) 1 As there are no brackets, do the multiplication first.

- 2 Do the addition and state your answer in simplest form.

- (b) 1 Perform the operation in the brackets first.

- 2 Next, perform any multiplication or division, cancelling any common factors.

- 3 Finally, perform any addition or subtraction. Write the answer in simplest form.

Working

$$\begin{aligned}(a) \quad & 3 + \frac{2}{5} \times \frac{1}{2} \\& = 3 + \frac{\cancel{2} \times 1}{5 \times \cancel{2}} \\& = 3 + \frac{1}{5}\end{aligned}$$

$$= 3\frac{1}{5}$$

(b) $\frac{6}{7} \times \left(1\frac{2}{3} + \frac{1}{4}\right) - \frac{3}{7}$

$$\begin{aligned}& = \frac{6}{7} \times \left(\frac{5}{3} + \frac{1}{4}\right) - \frac{3}{7} \\& = \frac{6}{7} \times \left(\frac{20}{12} + \frac{3}{12}\right) - \frac{3}{7} \\& = \frac{6}{7} \times \frac{23}{12} - \frac{3}{7}\end{aligned}$$

$$= \frac{6 \times 23}{7 \times 12} - \frac{3}{7}$$

$$= \frac{23}{14} - \frac{3}{7}$$

$$= \frac{23}{14} - \frac{6}{14}$$

$$= \frac{17}{14} = 1\frac{3}{14}$$

3.7 Mixed fraction problems

Navigator

Q1 Column 1, Q2 (a), Q3 (a) & (b),
Q4, Q5, Q6, Q11, Q14

Q1 Column 2, Q2, Q3, Q4, Q5,
Q6, Q7, Q9, Q11, Q12, Q13, Q15

Q1 Columns 2 & 3, Q2, Q3, Q5,
Q7, Q8, Q9, Q10, Q12, Q13,
Q14, Q15

Answers
page 639

Fluency

- 1 Simplify the following using the correct order of operations.

(a) $2 + \frac{3}{4} \times \frac{1}{3}$

(b) $5 - \frac{7}{8} \times \frac{1}{7}$

(c) $\frac{5}{11} \div (5 + 4)$

(d) $\frac{3}{4} \times \left(\frac{1}{3} + \frac{1}{6} \right) \times \frac{1}{2}$

(e) $\frac{7}{8} \times \left(\frac{9}{14} - \frac{2}{7} \right)$

(f) $\frac{5}{6} \times \left(\frac{2}{5} + \frac{1}{3} \right)$

(g) $1\frac{5}{8} + \left(1\frac{3}{4} - 1\frac{1}{8} \right) \times 5$

(h) $2\frac{3}{4} + \left(4\frac{1}{2} - 3\frac{1}{4} \right) \times \frac{1}{2}$

(i) $1\frac{3}{5} + \left(3\frac{3}{10} - 1\frac{1}{5} \right) \div 2$

(j) $1\frac{1}{4} - \left(3\frac{1}{3} - 2\frac{5}{6} \right) \div 2$

(k) $3\frac{3}{8} + \left(8\frac{1}{4} - 6\frac{3}{8} \right) \div 3$

(l) $\frac{7}{9} \div \left(1\frac{5}{6} - 1\frac{3}{5} \right) \times \frac{1}{5}$

2 (a) $\frac{3}{7} \times \frac{1}{3} + 5 =$

A $5\frac{1}{7}$

B $5\frac{1}{3}$

C $5\frac{5}{21}$

D $5\frac{7}{9}$

(b) $6 - \frac{9}{13} \div \frac{3}{4} =$

A $5\frac{1}{13}$

B $5\frac{25}{52}$

C $5\frac{12}{13}$

D $7\frac{1}{13}$

Understanding

- 3 Write out the following questions using fractions, the operations symbols ($\times, \div, +, -$) and brackets where necessary. Then, evaluate using the correct order of operations.

(a) Add $\frac{7}{8}$ and $\frac{5}{6}$, and then multiply the total by 2.

(b) Find the product of $\frac{4}{5}$ and $\frac{1}{3}$, then add $1\frac{1}{2}$.

(c) Find the difference between $2\frac{4}{5}$ and $1\frac{2}{3}$, then multiply by 3.

(d) Find out how many $\frac{2}{3}$ s in 5, then multiply by 4.

- 4 A survey was taken of 120 people as they left Wally's Sandwich Bar. Write your answers to the following in simplest form.

(a) If 80 were male, what fraction were male?

(b) What fraction were female?

(c) If 45 were under 21 years of age, what fraction were under 21?

(d) What fraction were 21 or over?

(e) If $\frac{3}{4}$ had bought a drink, how many had bought a drink?

(f) Of those who bought a drink, $\frac{2}{5}$ had bought a salad roll. How many people had a drink and a salad roll?

WE19

- 5 Grant is training in his backyard pool for the 1500 m freestyle at the next Olympics. Unfortunately, the pool is only 20 m in length.
- What fraction of the total 1500 m race would he have swum after completing just 1 lap?
 - How many laps would he have to complete to swim 1500 m?
 - What fraction of the total 1500 m race would he have swum after completing 6 laps?
 - How far would he have swum if he had completed $\frac{1}{10}$ of the race distance?
 - How far would he have swum if he had completed $\frac{3}{4}$ of the race distance?



- 6 Valerie is running laps of her school oval to train for Rigby High's Mini Marathon. She ran $4\frac{1}{2}$ laps before having to rest. After her rest, she ran another $3\frac{1}{4}$ laps before stopping again. Then, she struggled through another $\frac{1}{3}$ of a lap. How many laps did she complete altogether?
- 7 One weekend, Louisa and Andrew walk from Ferndale to Greenhill and back, a total of $2\frac{3}{4}$ km. The next weekend they walk from Ferndale through Greenhill to Highvale, which is $5\frac{1}{3}$ km.
How far (in km) is it from:
- Ferndale to Greenhill
 - Greenhill to Highvale
 - Ferndale to Highvale and back again?

- 8 Jeremy worked at an amusement park for 4 hours at the normal hourly rate, then another $2\frac{1}{2}$ hours at $1\frac{1}{2}$ times the normal rate. What was the equivalent number of normal hours he was to be paid?



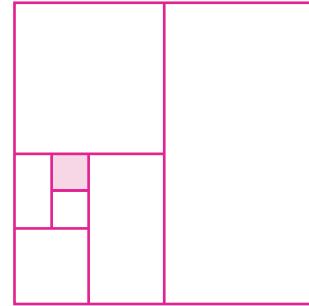
Reasoning

- 9 Theresa, Isabelle and Bryce worked on a mathematical problem and came up with the answers $8\frac{1}{2}$, $8\frac{2}{3}$ and $8\frac{3}{5}$, respectively. The correct answer was $8\frac{7}{12}$. Which of the three students was closest to the correct answer?
- 10 Despina's department store advertises a winter sale in which they claim everything is between $\frac{1}{3}$ and $\frac{1}{2}$ off. For which of the following items is this incorrect?

Item	Normal price	Sale price
Bath towels	\$22	\$12
Camera	\$900	\$600
Cutlery set	\$250	\$120
Microwave oven	\$540	\$350
Jeans	\$60	\$35



- 11 The Happy Valley Farming Cooperative has divided its square block of land in the way shown in the diagram. Each section of land is exactly half of the section next to it.
- The May family has been given the shaded region to farm. If the total block of land is 1, what fraction of the total *don't* the May family farm?



Draw a diagram or flowchart to show this process.



- 12 Prashanth has agreed to sell badges for a charity. He receives a large box and places them, with permission, at the school reception. After several days, Prashanth took an estimate of the number of badges he had left. He emptied out the box, divided the pile of badges roughly into halves, and put half back in the box. He then halved the pile he had left, and returned half to the box. He did this one more time, after which he counted the number of badges in the pile, and found he had 13.
- What fraction of the total number of badges does 13 represent?
 - How many badges did Prashanth have in the box, approximately?

Open-ended

- 13 Write down three numbers in fraction form that are less than $\frac{7}{8}$ but greater than $\frac{1}{2}$.
- 14 A and B are two different numbers selected from the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, where A is always greater than B.
- What values can $\frac{A+B}{A-B}$ have? Give three possibilities.
 - What is the largest value this fraction can have?
- 15 'Ideal fractions' are pairs of fractions whose sum and product are the same. (They give the same number when added as when multiplied.)
- Show that $\frac{7}{3}$ and $\frac{7}{4}$ are ideal fractions.
 - Show that $\frac{5}{3}$ and $\frac{5}{2}$ are ideal fractions.
 - Look carefully at the numerators and denominators of the fraction pairs in (a) and (b). Try to find a pattern.
 - Write down another pair of ideal fractions.

Outside the Square Problem solving

Mega-equivalents

- Use four of the digits 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 to make a fraction equivalent to $\frac{1}{2}$ that has two digits in the numerator and in the denominator (e.g. $\frac{34}{68}$).
- Now, use six digits to make another fraction equivalent to $\frac{1}{2}$ that has three digits in the numerator and denominator.
- See if you can form another fraction equivalent to $\frac{1}{2}$ using eight digits (four in numerator and denominator).
- Can you make a fraction equivalent to $\frac{1}{2}$ using all 10 digits?



Strategy options

- Guess and check.
- Test all possible combinations.

Challenge 3



- 1 If $\frac{1}{3}$ of a number is 16, then $\frac{3}{8}$ of this number is:
A 8 **B** 16 **C** 18 **D** 24
- 2 Kerry bought a new water tank for her garden. The tank is initially empty, but fills to $\frac{2}{3}$ full of capacity after rain. The tank now holds 480 litres of water. How many litres does the tank hold when full?
- 3 If ∇ lies between $\frac{1}{4}$ and $\frac{3}{8}$, and ∇ is a whole number, then ∇ equals:
A 5 **B** 6 **C** 7 **D** 8
- 4 Two proper fractions (in simplest form) are subtracted, the first with a denominator of 10, and the second with a denominator of 6. If the answer is given in simplest form, the largest possible numerator that it could have is:
A 8 **B** 9 **C** 11 **D** 22
- 5 The number halfway between $\frac{1}{5}$ and $\frac{1}{20}$ is:
A $\frac{1}{10}$ **B** $\frac{1}{8}$ **C** $\frac{7}{40}$ **D** $\frac{1}{4}$
- 6 Two frogs live together in a backyard pond. One frog croaks every 4 minutes, the other frog croaks every $2\frac{1}{2}$ minutes. If they both croak together at 11 a.m., what is the first time after 1 p.m. that they will croak together?



- 7 $2 + \frac{6}{1 + \frac{1}{2}}$ equals:
A 2 **B** 4 **C** 6 **D** 8
- 8 Express this fraction in its simplest form:

$$\frac{1}{3 + \frac{1}{3 + \frac{1}{3 + \frac{1}{3}}}}$$

- 9 If 60 is added to one-third of a number, the resulting value is double the number. What is the number?
- 10 Five numbers are put in a row from smallest to largest. The difference between each adjacent number (a number and the number next to it) is the same. If the first number is $\frac{1}{8}$ and the last is $\frac{1}{6}$, what are the three numbers in between, in simplest form?
- 11 Tom was born into a strange mathematical family. His grandmother sent him a money voucher for his birthday. The card said:

Dear Tom,

I am giving you the following amount to spend as your wish

$\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ of $\frac{5}{6}$ of $\frac{6}{7}$ of $\frac{7}{8}$ of $\frac{8}{9}$ of $\frac{9}{10}$ of \$1000.

Love Grandma

How much birthday money did Tom receive?

Chapter review

3

D.I.Y. Summary

Key Words

cancelling	improper fraction	mixed number	simplest form
denominator	inverse	numerator	simplify
equivalent fractions	Lowest Common Denominator (LCD)	proper fraction	unit fraction
fraction			

Copy and complete the following using the words and phrases from this list, where appropriate, to write a summary for this chapter. A word or phrase may be used more than once.

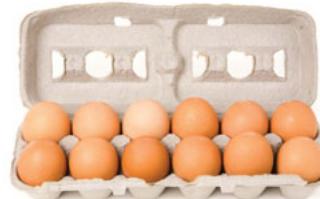
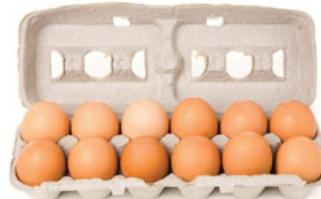
- 1 In a fraction, the _____ tells us how many parts we have, and the _____ tells us the size of each part.
 - 2 A _____ has a value between 0 and 1.
 - 3 To _____ a fraction, divide the numerator and denominator by a common factor. This process is known as _____.
 - 4 Dividing by a fraction is the same as multiplying by the _____ of the fraction.
 - 5 An _____ has a numerator that is greater than or equal to the denominator.
 - 6 _____ are located at exactly the same position on a number line.
 - 7 A _____ is a fraction with a numerator of 1.

Fluency

- 1** Here are 3 dozen (36) eggs.

(a) If $\frac{4}{9}$ of the eggs are slightly cracked, how many eggs are damaged?

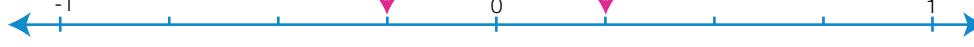
Ex. 3.1, 3.2



- (b)** The farmer's 3 best hens laid 15 of the eggs pictured. What fraction of the total is this?
Write your answer in simplest form.

2 Write the value of the fractions shown by the arrows on this number line:

- 2** Write the value of the fractions shown by the arrows on this number line.



- 3** Write **(a)** 6 and **(b)** 11 as improper fractions with denominators of

Ex. 3.1

- 4** (a) 3 pizzas are shared between 5 students. Write the amount of pizza each student gets as a fraction.

(b) 7 packets of lollies are shared between 4 students. Write the number of packets each student receives as a mixed number.

(b) 7 packets of lollies are shared between 4 students. Write the number of packets each student receives as a mixed number.

Ex. 3.1

5 Find equivalent fractions by copying and completing the following.

(a) $\frac{2}{7} = \frac{12}{\square}$

(b) $\frac{12}{18} = \frac{\square}{6}$

(c) $\frac{15}{30} = \frac{45}{\square}$

(d) $\frac{\square}{24} = \frac{5}{4}$

Ex. 3.2

6 Write the following fractions in their simplest form.

(a) $\frac{12}{15}$

(b) $\frac{48}{20}$

(c) $3\frac{60}{72}$

(d) $1\frac{8}{40}$

Ex. 3.2

7 (a) Write $3\frac{2}{7}$ as an improper fraction.

(b) Write $\frac{50}{9}$ as a mixed number.

8 Copy and complete the following by inserting $<$, $>$ or $=$.

(a) $\frac{5}{13} \underline{\quad} \frac{1}{2}$

(b) $\frac{6}{16} \underline{\quad} \frac{30}{80}$

(c) $\frac{5}{12} \underline{\quad} \frac{3}{8}$

(d) $\frac{8}{9} \underline{\quad} \frac{9}{10}$

Ex. 3.2

9 Evaluate the following. Estimate first to check that your answers are reasonable.

(a) $\frac{5}{12} + \frac{7}{8}$

(b) $\frac{7}{18} - \frac{2}{9}$

(c) $\frac{2}{3} - \frac{2}{7}$

(d) $\frac{1}{6} + \frac{7}{10}$

Ex. 3.4

10 Evaluate the following. Write your answers as mixed numbers in simplest form.

(a) $3\frac{2}{5} - 1\frac{3}{4}$

(b) $2\frac{1}{4} + 5\frac{11}{12}$

(c) $8 - 2\frac{5}{7}$

(d) $4\frac{5}{6} - 4\frac{2}{3}$

Ex. 3.4

11 Calculate the following.

(a) $\frac{3}{7}$ of \$28

(b) $\frac{2}{9}$ of $\frac{3}{4}$

Ex. 3.5

12 Evaluate the following.

(a) $\frac{6}{11} \times \frac{55}{18}$

(b) $2\frac{4}{9} \times 5$

(c) $\frac{2}{3} \times \frac{9}{16} \times 1\frac{1}{7}$

Ex. 3.5

13 Evaluate the following.

(a) $9 \div \frac{3}{4}$

(b) $21 \div 3\frac{2}{7}$

(c) $\frac{6}{5} \div \frac{32}{15}$

(d) $3\frac{1}{4} \div 3\frac{1}{3}$

Ex. 3.6

14 Simplify by using the correct order of operations.

(a) $4 + \frac{5}{6} \times 2\frac{1}{3}$

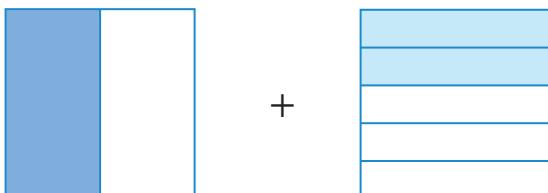
(b) $7\frac{2}{5} - \left(3\frac{1}{10} - \frac{3}{5}\right)$

(c) $\frac{7}{8} \times \left(\frac{3}{4} + 4 \times \frac{3}{4}\right)$

Ex. 3.7

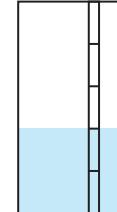
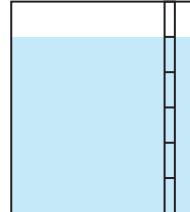
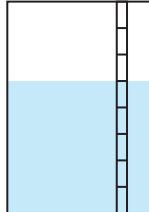
Understanding

15 (a) What fraction sum is represented by the following two grids?



(b) Calculate the fraction sum using the grid method or any other method.

- 16** Write a fraction or a mixed number in simplest form to show each of these:
- eight chocolate biscuits in a packet of 24
 - two complete '6-packs' of soft drink cans, with one can left over
 - one packet of twelve colour pencils and four pencils in a second packet
 - nine hours sleep in one day.
- 17** There are 12 boys and 15 girls in class 7A. 6 of the students have blond hair, and 2 have red hair. Write the following as fractions of the whole class, in simplest form.
- the number of girls
 - the number of blond-haired students
 - the number of students with neither blond nor red hair
- 18** Write each set of numbers in order from smallest to largest, by using strategies for comparing fractions.
- $\frac{3}{4}, \frac{1}{2}, 1, \frac{1}{3}, \frac{3}{5}$
 - $2, \frac{13}{5}, \frac{5}{4}, \frac{30}{50}, 1\frac{2}{5}$
- 19** Jamal gets 7 out of 9 shots at goal in the netball ring, whereas Kayla gets 9 out of 12 shots in. Determine who is the more accurate shooter by comparing fractions.
- 20** Elise and Reece each have an identical block of chocolate. Elise eats $\frac{2}{5}$ and Reece eats $\frac{2}{3}$.
- How much more has Reece eaten, as a fraction of a block?
 - Together, have Elise and Reece eaten more or less than a whole block of chocolate? Estimate, then calculate your answer.
- 21** Gary had $1\frac{1}{2}$ bags of cement in his shed. He used $\frac{2}{3}$ of a bag to mix up some concrete. What fraction of a full bag does he have left?
- 22** Jarrod owns a petrol station that has three main fuel tanks. There is a dip stick in each tank that shows the level of fuel remaining in each tank. How many litres are left in each tank?
- Full tank = 48 000 L
 - Full tank = 60 000 L
 - Full tank = 30 000 L



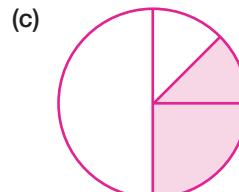
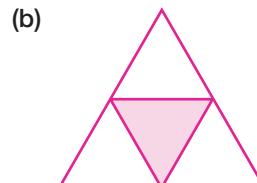
- 23** Here are the ingredients for a choc-orange cake:

180 g butter	$\frac{2}{3}$ cup castor sugar	4 eggs
$1\frac{3}{4}$ cups self-raising flour	2 tablespoons cocoa	$\frac{1}{2}$ cup orange juice

Rewrite the ingredients to make a cake that is one-quarter of the size of this cake.

Reasoning

- 24** State the fraction of the area of these shapes that is shaded.



- 25 45 minutes into a Fun Run, Katya had completed 4 km of the 10 km course, whereas Mabok had completed 7 km of the 15 km course.
- Who had the least distance still to run?
 - Who had completed a bigger fraction of their particular course?
- 26 Which of the following will give an answer of 1?

A $\frac{1}{4} \div \frac{1}{4}$

B $\frac{1}{2} \div \frac{1}{4}$

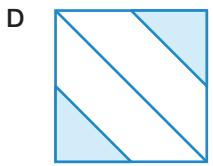
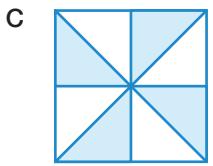
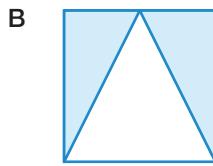
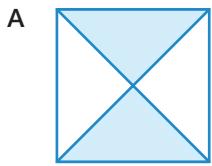
C $1 \div \frac{1}{4}$

D $4 \div \frac{1}{4}$

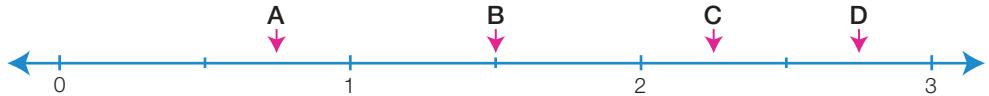
NAPLAN practice 3

Numeracy: Non-calculator

- 1 Which diagram does not have exactly $\frac{1}{2}$ of the area shaded?



- 2 Which arrow is pointing closest to the location of $\frac{11}{8}$ on this number line?



- 3 Kevin is mixing sand, gravel and cement to make concrete. Sand makes up $\frac{1}{2}$ of the mixture, and gravel is $\frac{1}{3}$. What fraction of the mixture is cement?

A $\frac{1}{6}$

B $\frac{1}{5}$

C $\frac{1}{4}$

D $\frac{1}{3}$

- 4 Esther is making vanilla ice-cream using these ingredients that make 6 servings:

5 eggs

1 cup sugar

2 cans condensed milk

6 cups milk

$1\frac{1}{2}$ teaspoons vanilla

How many teaspoons of vanilla will Esther need to make 30 servings?

A $5\frac{1}{2}$

B $7\frac{1}{2}$

C $30\frac{1}{2}$

D 45

Numeracy: Calculator allowed

- 5 A school has 200 students. 48 of the students are involved in the school production. The fraction of students who are involved in the school production is closest to:

A one-fifth

B one-quarter

C one-third

D one-half

- 6 Which of the following fractions is greater than 2 but less than 3?

A $\frac{3}{4}$

B $\frac{12}{9}$

C $\frac{17}{7}$

D $\frac{15}{5}$

- 7 Imran ran $\frac{1}{6}$ of a cross-country course. He ran 3 km. How long is the course?

A 6 km

B 9 km

C 12 km

D 18 km

- 8 Which fraction lies exactly halfway between $\frac{3}{8}$ and $\frac{4}{8}$ on the number line?

A $\frac{3}{16}$

B $\frac{1}{4}$

C $\frac{1}{3}$

D $\frac{7}{16}$