Fractions, percentages, decimals – extension

Learner guide

Working with numbers

Pre-employment skills

Fractions, percentages, decimals – extension

Version 1.1

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Contents

10 per cent

When a person buys something that costs a lot, like a car or a house, they often pay a deposit. This means they first pay a small amount of money and then pay the rest later. A deposit is usually 10 per cent (or 10%) of the full price. So the rest of the price, which is paid later, is 90% of the total price (because 10% + 90% = 100%).

10% deposit is $10 in every $100 of the full price. 10% deposit is also $100 in every $1,000 of the full price. Another way to work out 10% is to divide the full price by 10. With some practice it is quite easy to divide a number by 10 in your head, so you can work out 10%.

Story

Lin is buying a car. She has saved $2,000. She wants to buy a car costing $25,000. Lin thinks she has nearly enough for a 10% deposit, but she's not sure. Does she have enough?

10% is a part of 100%

As you know, 100% is the total amount or the full price.

To find 10%, divide the full price into 10 equal parts, like in the diagram below.

So, each part is 10%. If you count up the pieces, 10, 20, 30, 40 … and so on, you reach 100%.

This means that if you want to find 10% of a total amount or price, you divide the total amount by 10.

1

Activity 1

2

Use a calculator to help you find these 10% deposits or work them out in your head.

Full price	10% deposit amount
$100	
$1000	
$500	
$650	
$70	
$80	
$75	
$25,000	

Click to complete Activity 1

Dividing by 10 without a calculator

Here are some sums that can be worked out without a calculator.

3000 ÷ 10 = 300

150 ÷ 10 = 15

10,000 ÷ 10 = 1,000

1400 ÷ 10 =

Did you notice that all the first numbers above (3000, 150, 10,000 and 1400) end in 0?

If a number ends in 0, there is a trick to dividing it by 10. All you need to do is remove one 0.

So for 3000 ÷ 10, remove one 0 from the number 3000. This makes 300.

Remember, you can only do this with numbers without decimal points.

The next sums have numbers without a zero at the end (75, 155, 306 and 199). Remember, 75 is the same as 75.0 and 155 is the same as 155.0. But when you write them, you don't need to include the number after a decimal point if it is 0. You can just think of them as 75. and 155. (without the zeros).

Check these sums with a calculator:

75 ÷ 10 = 7.5

155 ÷ 10 = 15.5

306 ÷ 10 = 30.6

199 ÷ 10 = 19.9

Did you notice something about the answers?

When these numbers are divided by ten, the decimal point (which is at the end of the number) moves from the end of the number one place to the left. For example:

75 ÷ 10 = 7.5

is the same as

75.0 ÷ 10 = 7.5

The decimal point moves one place left from after the 5 to before the 5.

3

If there are more numbers after the decimal point (like in the following sums) that's okay. You still just move the decimal point one place to the left.

See if you can work out these answers in your head. Then, check them with a calculator:

49.90 ÷ 10 =

685.80 ÷ 10 =

10.50 ÷ 10 =

Did you see how the decimal point moved one place to the left.

So: 49.90 ÷ 10 = 4.990 or 4.99 (which is the same thing).

Dividing by ten is also called one tenth or 10 times smaller.

Activity 2

A shop is having a 10% off sale. Find the 10% discount amount for each of these items:

Item	10% discount
$2 ball	
$50 shirt	
$38 toy	
$599 camera	

Click to complete Activity 2

10% of and 10% off

Look carefully at the words when you are working out percentages.

10% **of** 50 means part of, or dividing 50 by 10. So, 10% **of** 50 is 5.

10% **off** 50 means minus, or take away 10% from 50. So, 10% **off** 50, is like saying 50 – 10%, which is 50 – 5. So 10% **off** 50 is 45.

Activity 3

A shop is having a 10% **off** sale. How much will each of these items be after 10% off? First find the 10% discount amount. Then, take away the discount amount from the original price. The first one has been done for you.

Note: Try to work out the 10% in your head, using the tips you have learnt.

Item	10% discount	Price after 10% off
$10 batteries	$1	$9
$25 DVD		
$68 vase		
$60.50 bag		
$357.80 heater		
$199.95 jacket		

Click to complete Activity 3

Using % on the calculator

The % (per cent) button on the calculator can be used to take off 10%.

For example, to take 10% off $20, press these buttons:

20 – 10 % (don't press = yet)

The answer is $18.

Now, press =

You will get –2. This is the 10% amount that has been taken off.

Note: some calculators may work slightly differently. You may need to press = for the final answer.

Shopping and decimals

Many prices in shops have dollars and cents such as $9.99.

When you pay by cash $9.99 is really $10.00. This is because we no longer have 1 cent pieces in Australia to give for change.

Because you can't pay $9.99 in cash, we round the number up. This means we are charged the nearest whole dollar to the price. So $9.99 is rounded up to $10.00.

We call $10.00 a round number. This is a number ending in a zero, and not containing a fraction. For example, $1.50 is not a round number as .50 is half, which is a fraction.

> Numbers that don't contain a fraction and end in zero are called round numbers.

Story

Lin is at the supermarket. She buys fruit and vegetables and has $10.00 left. She sees some pineapple on special for $4.95 per kilogram (kg). Lin wants to buy 2 kg, but she's not sure if she has enough money left.

Working with round numbers

How can Lin work out if she has enough money left for the pineapple? Lin can round the price per kilogram up, to make it easier. So, Lin can round $4.95 up to the nearest round number, which is $5.00. So if one kg is nearly $5.00, two kg are about $10. That means Lin has enough money for the pineapple.

A round number makes it easy to do a sum quickly in your head. It is much easier to work out $5.00 + $5.00, than to work out $4.95 + $4.95.

Rounding to the nearest dollar

When rounding numbers, you round to the nearest round number. Sometimes this means rounding up and sometimes this means rounding down.

$1.80 is rounded to $2.00, because $1.80 is closer to $2.00 than to $1.00.

$1	$1.20	$1.40	$1.60	$1.80	$2
$1.10	$1.30	$1.50	$1.70	$1.90	

$1.50 is in the middle. Numbers in the middle are rounded up.

$1.40 is closer to $1.00, so is rounded down to $1.00.

Activity 4

Round these numbers to the nearest dollar.

1. $0.80 = _____

2. $9.50 = _____

3. $6.05 = _____

4. $4.55 = _____

Click to complete Activity 4

8

Rounding to the nearest $10

If the numbers are in the tens such as $45 or $67, then rounding them to the nearest ten makes them easier to use.

$45 is rounded up to $50 (remember, we round up numbers in the middle).

$67 is rounded up to $70.

$32 is rounded down to $30.

Activity 5

Round these numbers to the nearest $10.

1. $38 = _____

2. $89 = _____

3. $74 = _____

4. $11= _____

Click to complete Activity 5

9

Working out an estimate

If you round money to the nearest dollar or nearest 10 dollars, you can make an estimate (good guess) in your head.

For a bill of $5.85 + $13.60, you can round the numbers to estimate the total.

So, $5.85 + $13.60 rounded is $6.00 + $14.00, which is about $20.00.

When you work it out exactly on a calculator, $5.85 + $13.60 = $19.45, which is very close to $20.00

It's much easier to estimate with rounded numbers.

> An estimate is a good guess, or a rough amount.
>
> It is a number close to the exact amount.

Activity 6

Round these numbers to the nearest dollar or nearest 10 dollars, to estimate the total. Then use a calculator to work out the exact amount.

The first one has been done for you.

$3.87 + $6.29 rounded, is $4.00 + $6.00 = $10.00

Exact amount: $10.16

	Estimate	Exact amount
1. $2.85 + $9.50	_____ + _____ = _____	
2. $4.65 × 4	_____ × _____ = _____	
3. $38.00 + $63.00	_____ + _____ = _____	
4. $26 × 5	_____ × _____ = _____	

Click to complete Activity 6

Calculating exact numbers in your head

If you want an exact answer, you can use a calculator or adjust the number in your head to make it easier. Here is how to adjust a number in your head.

You want to work out the exact cost of 2 kg of pineapple at $4.95 per kg.

First, round $4.95 to $5.00 by rounding up, which means adding on 5 cents.

So, if 1 kg is about $5.00, you know 2 kg costs about $10.00. But this isn't the exact amount.

To work out the exact amount, just take away (minus) the 5 cents you added for each kilogram, (10 cents for the 2 kg) from the rounded amount, $10.00.

So, $10.00 – 10 cents = $9.90, which is the exact amount of $4.95 + $4.95.

Activity 7

First, work out an estimate in your head for each of these sums. Then, work out the exact price by adjusting the number using rounding. The first one has been done for you.

Sum	Estimate	Exact price
$5.90 × 5 =	$6.00 × 5 = $30.00 Adjustment: 10c × 5 = 50c $30.00 – 50c = $29.50	$29.50
$3.15 × 4 =		
$69.90 + $18.90 =		
$100.00 – $29.95 =		

Click to complete Activity 7

Understanding a receipt – rounding to the nearest 5 cents

Next time you go supermarket shopping, look at the receipt.

Look at the bottom of the receipt. Sometimes it includes the amount that has been rounded, like the one below.

```
     Gertie's Goodies
     123 Runway Lane

Sub total:    $12.33

Cash:         $50.00

Rounding:      $0.02

Change:       $37.65
```

Look at the rounding at the bottom. $12.33 is rounded up to $12.35 when you pay with cash because the smallest coin you can pay with is a 5 cent piece.

When rounding, a cent amount ending in 3, 4, 8 or 9 is rounded up.

$26.53 is rounded up + $0.02, and you pay $26.55

$19.99 is rounded up + $0.01, and you pay $20.00

A cent amount ending in 1, 2, 6 or 7 is rounded down.

$18.12 is rounded down – $0.02, and you pay $18.10

$9.96 is rounded down – $0.01, and you pay $9.95

Activity 8

Complete the table with the rounding amount and the amount you pay for each of these totals. The first one has been done for you.

Price	Rounding amount	Amount you pay
$49.27	–$0.02	$49.25
$82.71		
$75.15		
$78.64		
$64.86		
$57.78		

Click to complete Activity 8

14

Understanding a receipt – the cost of part of a kilogram

You don't always have to buy exactly 1 kg of ham or apples or fish. The scales at the shop can calculate the price of part of a kilogram. Your receipt will show the important numbers to work out the cost.

A receipt may say:

1.5 kg apples @ $ 3.99/kg

This means you bought 1.5 kg of apples that cost $3.99 for each kilogram.

Sometimes the receipt shows x (times), which is the way to work out the cost.

1.5 kg apples × $3.99/kg

Calculating part of a kilogram in your head

Use rounding to calculate part of a kilogram.

1 kg costs $3.99, so round this up to $4.00

½ or 0.5 kg then costs half of the $4.00, which is $2.00

So, 1.5 kg costs: $4.00 + $2.00 = $6.00

Using a calculator

Use a calculator to check your answer.

1.5 kg × $3.99 = $5.985, which you round to $5.99. But remember, if you pay by cash you will pay $6.00.

Activity 9

Work out the cost of these items in your head by rounding the numbers. The first one has been done for you. Note: the number you get is a good estimate.

1.972 kg bananas @ $3.29/kg =

2 kg × $3.00 = $6.00

1.   2.212 kg mandarins @ $4.85/kg =

_____

2.   0.480 kg nuts @ $13.00/kg =

_____

3.   4.013 kg potatoes @ $1.89/kg =

_____

Click to complete Activity 9

Comparing numbers

We often compare numbers. For example, we compare prices, or the amount of rain from one year to the next. We compare our score with the total. We think, 'Are the numbers the same or different?', 'Which number is bigger?'and 'How much bigger is the number?'

It is easy to tell which number is bigger by looking at it. To work out how much bigger one number is compared with another, we find the difference. This means taking (subtracting) the smaller number from the larger number.

> To work out the difference between
>
> 5 and 12, subtract 5 from 12.
>
> 12 – 5 = 7
>
> The difference is 7.

Sometimes numbers may be very different from each other. At these times you may say, 'The number is double this year' or 'The number is half what it was'. This means we are looking at how many times one number is more than the other; for example, double or half.

Story

Lin's niece, Aimee, has just passed her learner's permit test to get a driver's licence. Aimee is very pleased. She scored 80%. She only got two answers wrong out of 20 questions. Lin wonders how it is that 18 out of 20 is 80%.

Finding a percentage

A person does a test with 10 questions and gets them all right.

Their score is 100%. You can also say they got 10 out of 10. You can write this in a fraction as $^{10}/_{10}$.

Another person gets 9 correct out of 10 questions. That is written as a fraction as $^{9}/_{10}$.

They got 1 question wrong, which is $^{1}/_{10}$.

Remember $^{1}/_{10}$ is 10%.

So, 100% – 10% = 90%. This person got 90% correct.

Activity 10

1. $^{100}/_{100}$ is the same as 100%. Write three more fractions that equal 100%.

   _____

2. $^{25}/_{50}$ is the same as 50%. Write three more fractions that equal 50%

   _____

Click to complete Activity 10

First a fraction and then a percentage

To find a percentage, first write the two numbers as a fraction. You can then decide the percentage. Remember, a percentage is easy to find if something is out of 100, because 100 is the whole. For example:

25 cents in every dollar is $^{25}/_{100}$.

$^{25}/_{100}$ is 25 out of 100%, which equals 25%.

Activity 11

Complete the following table. Write the numbers first as a fraction and then decide the percentage.

Amount	Fraction	Percentage
$50 out of $100		
650 out of 650		
$20 out of $200		
$50 out of $200		
75c in the dollar		
35c in the dollar		

$4 out of $5, or $4 in $5, or 4 over 5 are different ways to say the fraction $^4/_5$.

Click to complete Activity 11

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Using a calculator to find a percentage

Finding a percentage using a calculator is easy.

We know that 20 out of 20 is written $^{20}\!/_{20}$.

(Note: the line in the fraction means ÷)

Using a calculator, put in 20 ÷ 20%.

The calculator display shows 100, meaning 100%.

Note: Some calculators may work differently; for example, you may get a decimal number. If you do, just press = for the percentage amount.

Activity 12

Complete the following table. First, write the numbers as a fraction, then use a calculator to find the percentage.

Amount	Fraction	Percentage
10 out of 100		
40 out of 80		
35 out of 200		
16 out of 64		
65c in the dollar		
75c in $2.00		

Click to complete Activity 12

Decimals and percentages

What happens if you press = on a calculator, instead of %, when you do a sum like the following?

10 ÷ 50 =

Answer: you get a decimal answer, which is the same value as the percentage.

Remember, 100% as a decimal is 1, and 50% as a decimal is 0.5.

Activity 13

Using the same numbers as in Activity 12, complete the table to show the fraction and decimal number.

Amount	Fraction	Decimal
10 out of 100		
40 out of 80		
35 out of 200		
16 out of 64		
65c in the dollar		
75c in $2.00		

Click to complete Activity 13

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Activity 14

Fill in the missing numbers, as either a decimal or percentage.

1. 49% is 0._____

2. _____% is 0.99

3. 80% is 0._____

4. _____% is 0.08

5. 1% is 0._____

6. _____% is 0.76

7. 15% is 0. _____

8. _____% is 0.6

Click to complete Activity 14

Confidence with fractions, percentages and decimals

When you understand something, you feel confident. There is more than one way to calculate with percentages, decimals and fractions. Decide which is the best way for you to work something out, so you feel confident.

Story

Lin has two daughters. Her older daughter, Mandy, has problems with her school work and wants to leave school. Lin doesn't want her younger daughter, Claire, to have the same problems, so she asks her about her maths.

'I am just starting percentages', says Claire. Lin gives her some advice.

'Make sure you understand what you're doing. Ask the teacher if it's not clear.'

Three types of percentage calculations

There are three main percentage calculations:

1. Finding a percentage of a total (such as finding a deposit amount; for example, 10% of $300)

2. Adding on or subtracting a percentage (such as taking off a 15% discount)

3. Making one number into a percentage of another number (to compare a number with the total; for example, the dam is 54% full of water)

Let's look at each of these calculations and ways to do them.

Remember, if the numbers are round numbers like 10%, 20%, $300 or $5,000, you can do the calculation in your head. However, it is a good idea to check your answers using a calculator.

Finding a percentage of a total

20% of $300

In your head work out 10% of $300, which is $30.

So, 20% (which is 10% + 10%) of $300 is $30 + $30, which is $60.

> Remember, 20% means $20 in every $100.
>
> So for $300, 20% is $20 × 3, which is $60.

Check your answer using a calculator.

Put in 300 × 20 % (remember, you may or may not need to press = depending on the calculator)

The answer is 60.

When numbers are round numbers, like the ones above, try to work the sums out in your head. For example, 20% is double 10%, which is easy to use. And 300 is three times 100.

Activity 15

Find these percentages using any method you like:

1. 90% of $500 = _____

2. 40% of $1000 = _____

3. 23% of $300 = _____

4. 17% of $1,350 = _____

Click to complete Activity 15

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Adding or subtracting a percentage

Subtract a 15% discount from $80.

In your head, work out 10% of $80, which is $8.

Now, work out 5%, which is half of the 10%, or $4.00.

To find 15%, add the 10% amount to the 5% amount, so $8 + $4 = $12.

So, 15% of $80 is $12.

But remember, you need to find the price after the 15% discount, so do:

$80 (total price) – $12 (discount) = $68

To check your answer using a calculator, it's easy.

Do 80 – 15 % (and remember, you may or may not need to press =).

Activity 16

Find these amounts using any method you like:

1. $500 loan plus 15% interest = _____

2. $2,000 reduced by 12% = _____

3. $5,999 reduced by 20% = _____

Click to complete Activity 16

Making one number into a percentage of another number

23 cents tax as a percentage of a dollar

This is easy to work out in your head. You know that per cent means for every 100. So, 23 cents in a dollar is 23 cents in 100 cents and 23 cents as a percentage of a dollar is 23%.

Check your answer using a calculator.

First, change 23 cents in 100 cents to a fraction, which is $^{23}/_{100}$.

Now put in 23 ÷ 100 %.

$15 as a percentage of $60

Remember, this is like saying $^{15}/_{60}$. In your head, you can work out that 15 is one quarter of 60.

One quarter as a percentage is 25%.

Check your answer using the calculator.

Put in 15 ÷ 60%.

The answer is 25%.

Activity 17

Use any method to calculate these as percentages:

1.   84 tickets sold out of a total of 100 = _____

2. $538 paid out of a total bill of $800 = _____

3.   65 people at work out of a total of 110 = _____

4.   150 marks scored out of a total of 200 = _____

Click to complete Activity 17

Fraction calculations

When you think about fractions, sometimes it's helpful to think about a picture. The picture can help you with the numbers. This is possible with simple fractions.

However, if the fraction has more difficult numbers then you can turn it into a decimal using a calculator and work it out on the calculator.

If you don't have a calculator, you can:

- make the fraction into an easier fraction such as ½, ¼, ⅒ and make an estimate
- find a calculator on a computer or on a mobile phone.

Adding and subtracting fractions

½ + ½ = ²⁄₂ or one whole

⅓ + ⅔ = ³⁄₃ or one whole

1½ + ½ = 2

1⅓ + ⅓ = 1⅔
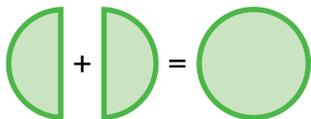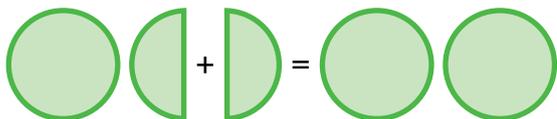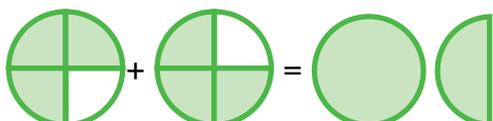
¾ + ¾ = ⁶⁄₄ or 1½

Activity 18

When cooking, sometimes you want to make double the recipe to make a large quantity. Double each of the amounts below. This means adding the number to itself.

Single amount	Double amount
¼ cup coconut	
1½ cups flour	
¾ cup sugar	
2½ cups rice	

Click to complete Activity 18

Finding the fraction of an amount

Look at the diagram of a clock face. You know there are 60 minutes in one hour, so you can work out fractions of one hour.

Half an hour is ½ of 60 (minutes), which is the same as 60 ÷ 2 = 30 minutes.

One quarter of an hour is ¼ of 60, which is the same as 60 ÷ 4 = 15 minutes.

Three quarters of an hour is ¾ of 60, which is the same as 60 ÷ 4 = 15 (to find ¼), then times this by three to find three quarters, 15 × 3 = 45 minutes.

These are all fractions of one hour.

You can work out other fractions in the same way:

⅓ of 24 is 24 ÷ 3, which equals 8.

So, ⅔ of 24 is 8 × 2, which equals 16.

Activity 19

The results of a survey are written in the newspaper. The paper reports that 120 people were surveyed in a country town. For each of the amounts find the exact number of people.

1. ½ the people came from overseas

    _____

2. ⅔ were born in the country

    _____

3. ¾ of them had children

    _____

4. ⅝ of them like to watch sport on TV

    _____

5. ⁷⁄₁₀ of them said they walk for exercise

    _____

Click to complete Activity 19

Remember, some fractions can be written in many different ways. Look at the diagram of the cake below.
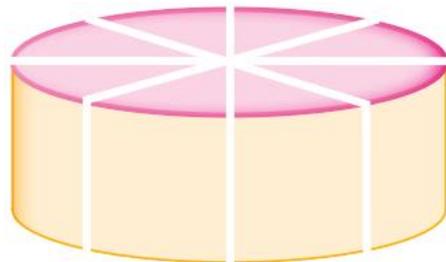
The cake is cut into 8 pieces. Each piece is ⅛ of the cake. Half the cake is ⁴⁄₈, but it is also ²⁄₄ or ½.

¾ of the cake is also ⁶⁄₈ of the cake.

Activity 20

A maths teacher makes a pizza for a class and decides to cut it into 6 pieces.
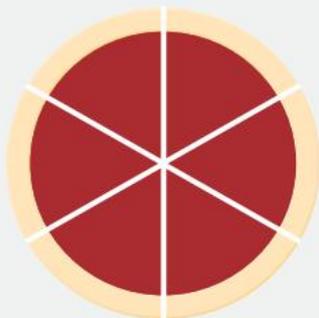
Before the students can eat the pizza they have a lesson.

1. What fraction is one piece of pizza?

    _____

2. What fraction is three pieces?

    _____

3. What is another fraction for three pieces?

    _____

4. How many pieces of the pizza is ⅔ of the pizza?

    _____

Click to complete Activity 20

What you have learnt

Put a ✓ in the box when you have learnt these things.

☐ A deposit is often 10% of the full price, which is the same as 10 out of every 100.

☐ If a number ends in a zero and you are dividing it by 10, all you have to do is remove the last zero to find your answer.

☐ If you are dividing a number without a zero at the end by 10, just move the decimal point one place to the left to find your answer.

☐ Rounding numbers helps you to make estimates.

☐ Numbers that don't contain a fraction and end in zero are called round numbers.

☐ When shopping, money is rounded up or down to the nearest five cents.

☐ Percentages can be used to compare numbers.

☐ The best method for finding fractions, percentages and decimals is the method that you are confident using.

Check your learning

Answer the following questions.

1. Are the following statements true or false?

Statement	True or False
After a 10% discount on a $40 tyre, you pay $36.	
A 10% price rise added to a $200 chair is $210.	
$500 is a 10% deposit of $5,000.	
10% off at a sale means that you pay 90% of the original price.	
$100 tax on every $1000 is a 10% tax.	
A 10% price rise on a $15 book is 15 cents.	

2. A shop is having a sale – choose your discount: $10 off or 10% off. Work out each amount and then which is the best choice. The first one has been done for you.

Price of item	$10 off	10% off	Best choice
$20 DVD	$20 – $10 = $10	$20 – $2 = $18	$10 off
$50 MP3 player			
$100 earphones			
$200 DVD player			
$1,000 TV			

3. At the supermarket, you want to buy:
   - 1.097 kg apples @ $3.48/kg
   - 2.117 kg oranges @ $3.99/kg

   Work out the total cost of fruit by rounding the numbers and doing a calculation in your head.

   Check your estimates with a calculator.

   _____

   _____

   _____

   _____

   _____

4. A sale is advertised as 'Pay only 60% of the usual price'. Check whether all these sale prices are 60% of the usual price. The first one has been done for you.

Sale price	Usual price	Fraction	Percentage	Is this 60% off?
$24	$40	24/40	60%	Yes
$320	$600			
$45	$75			
$51	$85			
$90	$150			

5. 25% is also ¼. 3 out of 12 is 25%, because 3 is one quarter of 12. Write down three more fractions that are 25%

_____

_____

_____

6. Are the following statements true or false?

Statement	True or False
1 ÷ 2 is the same as ½	
4 out of 4 is 100%	
5 out of 20 is 5%	
3 out of 4 is 1	
75% is ¾	
¼ is the same percentage as ⅛	

7. Complete the following table.

Question	Answer
$200 increased in price by 15% is now $ …	
15% of workers at a factory were absent. If the factory has a total of 200 people ____ people were away. _____ were at work.	
Lin paid a $15 deposit to buy a $200 pan. What percentage is the deposit?	

8. Use a calculator for each of the following percentage calculations.

Calculation	Answer
300 × 32 %	
300 + 32 %	
32 ÷ 300 %	

9. Are the following statements true or false?

Statement	True or False
²⁵⁄₁₀₀ is ¼	
⅘ is the same as ⁵⁄₁₀	
⅘ is the same as 0.5	
¾ of 100 is 75	
25% is the same as 0.4	
¼ of 10 is 0.4	
100% is the same as 60 out of 60	
⅓ + ⅓ is ²⁄₆	
1½ cups is the same as 1.5 cups	

Click to complete

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Answers

Answers to activities

Activity 1

Full price	10% deposit amount
$100	$10
$1000	$100
$500	$50
$650	$65
$70	$7
$80	$8
$75	$7.50
$25,000	$2,500

Activity 2

Item	10% discount
$2 ball	$0.20 or 20 cents
$50 shirt	$5
$38 toy	$3.80
$599 camera	$59.90

Activity 3

Item	10% discount	Price after 10% off
$10 batteries	$1	$9
$25 DVD	$2.5	$22.50
$68 vase	$6.8	$61.20
$60.50 bag	$6.05	$54.45
$357.80 heater	$35.78	$322.02
$199.95 jacket	$19.99	$179.95

Activity 4

Answer to Question 1

$1.00

Answer to Question 2

$10.00

Answer to Question 3

$6.00

Answer to Question 4

$5.00

Activity 5

Answer to Question 1

$40

Answer to Question 2

$90

Answer to Question 3

$70

Answer to Question 4

$10

Activity 6

Answer to Question 1

$3.00 + $10.00 = $13.00

Exact amount = $12.35

Answer to Question 2

$5.00 × 4 = $20.00

Exact amount: $18.60

Answer to Question 3

$40.00 + $60.00 = $100.00

Exact amount: $101.00

Answer to Question 4

$30.00 × 5 = $150.00

Exact amount = $130.00

Activity 7

Sum	Estimate	Exact price
$5.90 × 5 =	$6.00 × 5 = $30.00 Adjustment: 10c × 5 = 50c $30.00 – 50c = $29.50	$29.50
$3.15 × 4 =	$3.00 × 4 = $12.00 Adjustment: 15c × 4 = 60c $12.00 + 60c = $12.60	$12.60
$69.90 + $18.90 =	$70.00 + $19.00 = $89.00 Adjustment: 10c + 10c = 20c $89.00 – 20c = $88.80	$88.80
$100.00 – $29.95 =	$100.00 – $30.00 = $70.00 Adjustment: + 5c $70.00 + 5c = $70.05	$70.05

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Activity 8

Price	Rounding amount	Amount you pay
$49.27	–$0.02	$49.25
$82.71	–$0.01	$82.70
$75.15	0	$75.15
$78.64	+$0.01	$78.65
$64.86	–$0.01	$64.85
$57.77	+$0.02	$57.80

Activity 9

Answer to Question 1

2 kg × $5.00 = $10.00

Answer to Question 2

0.5 kg × $13.00 = $6.50

Answer to Question 3

4 kg × $2.00 = $8.00

Activity 10

Answer to Question 1

For example: $\frac{50}{50}$ or $\frac{10}{10}$ or $\frac{75}{75}$

Answer to Question 2

For example: ½ or $\frac{50}{100}$ or $\frac{15}{30}$

Activity 11

Amount	Fraction	Percentage
$50 out of $100	$^{50}/_{100}$ or ½	50%
650 out of 650	$^{650}/_{650}$	100%
$20 out of $200	$^{20}/_{200}$	10%
$50 out of $200	$^{50}/_{200}$	25%
75c in the dollar	$^{75}/_{100}$	75%
35c in the dollar	$^{35}/_{100}$	35%

Activity 12

Amount	Fraction	Percentage
10 out of 100	$^{10}/_{100}$	10%
40 out of 80	$^{40}/_{80}$	50%
35 out of 200	$^{35}/_{200}$	17.5%
16 out of 64	$^{16}/_{64}$	25%
65c in the dollar	$^{65}/_{100}$	65%
75c in $2.00	$^{75}/_{200}$	37.5%

Activity 13

Amount	Fraction	Decimal
10 out of 100	$^{10}/_{100}$	0.1
40 out of 80	$^{40}/_{80}$	0.5
35 out of 200	$^{35}/_{200}$	0.175
16 out of 64	$^{16}/_{64}$	0.25
65c in the dollar	$^{65}/_{100}$	0.65
75c in $2.00	$^{75}/_{200}$	0.375

Activity 14

Answer to Question 1

0.49

Answer to Question 2

99%

Answer to Question 3

0.80

Answer to Question 4

8%

Answer to Question 5

0.01

Answer to Question 6

76%

Answer to Question 7

0.15

Answer to Question 8

60%

Activity 15

Answer to Question 1

In your head: 10% of $500 is $50

90% is $500 less 10%, which is $500 – $50 = $450

On a calculator: 500 x 90 % is $450

Answer to Question 2

In your head: 40% is $40 in every $100, so $400 in $1000

On a calculator: 1000 x 40 % is 400

Answer to Question 3

In your head: 23% is $23 in every $100

So for $300, do $23 x 3, which is $69

On a calculator: 300 x 23 % is $69

Answer to Question 4

In your head: Too hard! Use a calculator.

On a calculator: 1350 x 17 % is $229.5

Activity 16

Answer to Question 1

In your head: 10% is $50, 5% is $25, so 15% is 50 + 25 = $75

Then $500 + $75 = $575

On a calculator: 500 + 15 % is $575

Answer to Question 2

In your head: 12% of $1000 is $120

So 12% of $2,000 is $120 x 2 = $240.

Then $2,000 – $240 = $1,760

On a calculator: 2000 – 12% is $1,760

Answer to Question 3

On a calculator: 5999 – 20 % is $4799.20

Activity 17

Answer to Question 1

84%

Answer to Question 2

On the calculator: 538 ÷ 800 % is 67.25%

Answer to Question 3

On the calculator: 65 ÷ 110 % is 59%

Answer to Question 4

In your head: 150 out of 200 is the same as 75 out of 100 or 75%

Activity 18

Single amount	Double amount
¼ cup coconut	¼ + ¼ = ²⁄₄ or ½ cup coconut
1½ cups flour	1½ + 1½ = 3 cups flour
¾ cup sugar	¾ + ¾ = ⁶⁄₄ or 1½ cups sugar
2½ cups rice	2½ + 2½ = 5 cups rice

Activity 19

Answer to Question 1

120 ÷ 2 = 60

Answer to Question 2

120 ÷ 3 = 40 (one third), so ⅔ is 2 × 40 = 80

Answer to Question 3

120 ÷ 4 = 30 (one quarter), so ¾ is 3 × 30 = 90

Answer to Question 4

120 ÷ 8 = 15 (one eighth), so ⅝ is 5 × 15 = 75

Answer to Question 5

120 ÷ 10 = 12 (one tenth), so ⁷⁄₁₀ is 7 × 12 = 84

Activity 20

Answer to Question 1

⅙

Answer to Question 2

³⁄₆ or ½

Answer to Question 3

½

Answer to Question 4

⅓ of the pizza is 2 pieces, so ⅔ is 4 pieces

Answers to Check your learning

Answer to Question 1

Statement	True or False
After a 10% discount on a $40 tyre, you pay $36.	True
A 10% price rise added to a $200 chair is $210.	False
$500 is a 10% deposit of $5,000.	True
10% off at a sale means that you pay 90% of the original price.	True
$100 tax on every $1000 is a 10% tax.	True
A 10% price rise on a $15 book is 15 cents.	False

Answer to Question 2

Price of item	$10 off	10% off	Best choice
$20 DVD	$20 – $10 = $10	$20 – $2 = $18	$10 off
$50 MP3 player	$50 – $10 = $40	$50 – $5 = $45	$10 off
$100 earphones	$100 – $10 = $90	$100 – $10 = $90	The same
$200 DVD player	$200 – $10 = $190	$200 – $20 = $180	10% off
$1,000 TV	$1,000 – $10 = $990	$1,000 – $100 = $900	10% off

Answer to Question 3

Estimate:

1 kg @ $3.50 = $3.50

2 kg @ $4.00 = $8.00

Total = $11.50

Exact answer:

1.097 kg apples @ $3.48/kg = $3.82

2.117 kg oranges @ $3.99/kg = $8.45

Total: $3.82 + $8.45 = $12.27

Answer to Question 4

Sale price	Usual price	Fraction	Percentage	Is this 60% off?
$24	$40	$^{24}/_{40}$	60%	Yes
$320	$600	$^{320}/_{600}$	53.33%	No
$45	$75	$^{45}/_{75}$	60%	Yes
$51	$85	$^{51}/_{85}$	60%	Yes
$90	$150	$^{90}/_{150}$	60%	Yes

Answer to Question 5

$^{2}/_{8}$, $^{50}/_{200}$ and $^{25}/_{100}$

Answer to Question 6

Statement	True or False
1 ÷ 2 is the same as ½	True
4 out of 4 is 100%	True
5 out of 20 is 5%	False
3 out of 4 is 1	False
75% is ¾	True
¼ is the same as ⅜	True

Answer to Question 7

Question	Answer
$200 increased in price by 15% is now $ ...	$200 + $30 = $230
15% of workers at a factory were absent. If the factory has a total of 200 people ___ people were away. ____ were at work.	30 people were away. 170 people were at work
Lin paid a $15 deposit to buy a $200 pan. What percentage is the deposit?	7.5%

Answer to Question 8

Calculation	Answer
300 × 32 %	96
300 + 32 %	396
32 ÷ 300 %	10.67

Answer to Question 9

Statement	True or False
$^{25}\!/_{100}$ is ¼	True
⅘ is the same as $^{5}\!/_{10}$	True
⅘ is the same as 0.5	True
¾ of 100 is 75	True
25% is the same as 0.4	False
¼ of 10 is 0.4	False
100% is the same as 60 out of 60	True
⅓ + ⅓ is ⅖	False
1½ cups is the same as 1.5 cups	True