Dear Grade 8's

We set up a work schedule for each week in June to keep your MATH up to date during lockdown.

You should already be finished with the previous work (1 June-5 June) placed on the website. This is the work for week two. Try not to fall behind.

Please complete each worksheet for each day in your exercise book and mark your work using the memo given. We will check if you completed all the worksheets once classes resume.

Remember to do all calculations on how you got your answers.

Read up about the work for the day in your textbook.

It will only take a few minutes a day.

We know we can count on you Grade 8's.

See you soon
From your Grade 8 Math Teachers

WHY FIT IN WHEN YOU WERE BORN TO STAND OUT?
-Dr.Seuss

Revision program from TERM 1

Date	Topics and Worksheets	Parental guidance
Monday– 8 June	Study Simple Interest Information and practice the example.	Your child should spent at least 1hour per day on Maths. If their written work is done they should study and practise Please check if work is done. This includes:
Tuesday - 9 June	Simple Interest Worksheet	
Wednesday - 10 June	Hire Purchase	
Thursday - 11 June	Exchange Rate	1. Information for topic of the day read from the textbook.
Friday - 12 June	Make sure you have completed all the worksheets given for the last two weeks. Please don't fall behind with the work!!	2. Worksheets given done. 3. Use Memorandum to check correctness of answers.
Bonus day!!	Fun for the Weekend.	

Simple Interest Information

Simple interest

All loans always have interest added on. This is basically the fee paid for borrowing the money. It is usually a percentage and is mostly calculated on a yearly basis (in this case, it is simple interest). The good news is – when you save money you can earn interest.

Simple interest works as follows: If you are borrowing money, a percentage of the amount borrowed is added to that amount annually. The same amount is added every year – even if a few years have passed and most of the loan may already have been paid back.

For example: if you borrow R 1000 and the interest charged is 12% p.a. (per annum or every year), how much would you pay back if:

a. you took 1 year to pay it back?

b. you took 5 years to pay it back?
   Solution: Interest paid: $P \times i \times n$ where P is the amount started with, i is the interest rate and n is the number of years. Once the interest has been found it will be added to the amount started with (P)

a. Interest: 12% of R1000 = $\frac{12}{100}$ × 1000 = 120

   Using the formula: Interest = $P \times i \times n$ = 1000 × 0,12 × 1 = 120

   Total amount to pay back: R1000 + R120 = R1120

   Note that only 1 × 120 was added because the loan is only for 1 year.

b. Interest: 12% of R1000 = $\frac{12}{100}$ × 1000 = 120

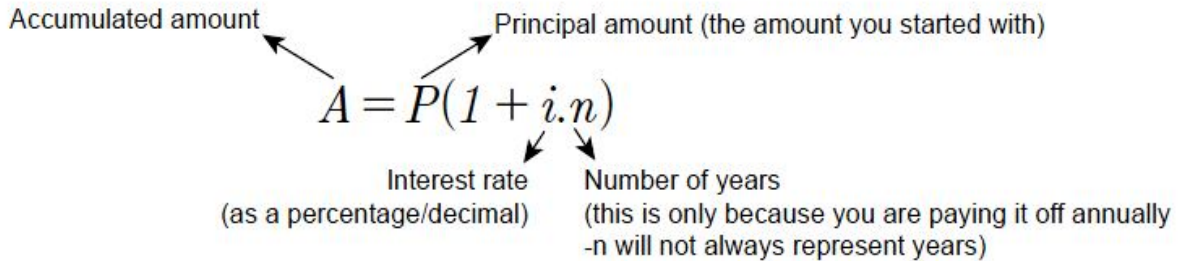   Using the formula: Interest = $P \times i \times n$ = 1000 × 0,12 × 5 = 600

   Total amount to pay back: R1000 + (R120 × 5) = R1000 + R600 = R1600

   Note that this person will pay R600 interest as the R120 calculated is what will be charged per year.

Simple Interest Information

There is a formula that can be used so that you can do this whole calculation at once instead of finding the percentage, then multiplying it by the number of years then adding it to the original amount (so much work!)

Accumulated amount   Principal amount (the amount you started with)

$$A = P(1 + i.n)$$

Interest rate   Number of years
(as a percentage/decimal)   (this is only because you are paying it off annually
-n will not always represent years)

Using the distributive law, you should see why this formula works:

$$A = P(1 + i.n)$$

$$A = (P \times 1) + (P \times i \times n)$$

$P \times 1$: The amount we started with $P \times i \times n$: the interest

Added together – they make the final amount

Example: Calculating interest on a deposit

Question:

Carine deposits R 1 000 into a special bank account which pays a simple interest rate of 7% p.a. for 3 years. How much will be in her account at the end of the investment term?

Solution:

Step 1: Write down known values.
$$P = R\ 1\ 000$$
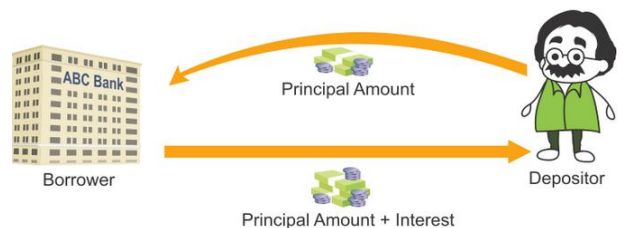$$I = 0{,}07\ \ (r = 7 \div 100)$$
$$n = 3$$
Step 2: Write down the formula
$$A = P(1 + in)$$
Step 3: Substitute the values

$$A = R\ 1\ 000(1 + 0.07 \times 3)$$
$$= R\ 1\ 210$$

Simple Interest Worksheet

Now try it yourself. Answer and show all the calculations in your exercise

Use the formula $S I = P.i.n$

1. An amount of R 3 500 is invested in a savings account which pays simple interest at a rate of 7,5% per annum. Calculate the balance accumulated by the end of 2 years.

2. An amount of R 4 000 is invested in a savings account which pays simple interest at a rate of 8% per annum. Calculate the balance accumulated by the end of 4 years.

Now use the formula $A = P(1+i.n)$

3. An amount of R 1 250 is invested in a savings account which pays simple interest at a rate of 6% per annum. Calculate the balance accumulated by the end of 6 years .

4. An amount of R 5 670 is invested in a savings account which pays simple interest at a rate of 8% per annum. Calculate the balance accumulated by the end of 3 years.

5. Calculate the accumulated amount in the following situations:

    A. A loan of R 300 at a rate of 8% for 1 year and 6 months.
    B. An investment of R 2 250 at a rate of 12,5% p.a. for 6 years.

6. Stephan would like to join a school trip to Namibia. He borrows R 13 000 to pay for the tour. The simple interest is calculated at 6,75% p.a. He will have to pay the money back in 5 years time (once he is working). How much will have to repay after 5 years?

Tight Budget

Simple Interest Memo

Answers:

1) Information:
P = R 3 500
i = 0,075 (7,5 ÷100)
n = 2 years
A = ?

Formula $\quad$ SI $\quad$ = P. i. n
Substitute values: $\quad$ = R 3 500 x 0,075 x 2
$\quad$ = R 525
Total amount $\quad$ (A) $\quad$ = R 3 500 + R525
$\quad$ = R 4 025

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2) Information:
P = R 4 000
i = 0,08 (8 ÷100)
n = 4 years
A = ?

Formula $\quad$ SI $\quad$ = P. i. n
Substitute values: $\quad$ = R 4 000 x 0,08 x 4
$\quad$ = R 1 280
Total amount $\quad$ (A) $\quad$ = R 4 000 + R1280
$\quad$ = R 5 280

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3) Information:
P = R1 250
i = 0,06 (6 ÷100)
n = 6 years
A = ?

Formula $\quad$ A = P(1+i,n)
$\quad$ = R 1 250 (1+(0.06 x 6))
$\quad$ = R 1 700

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4) Information:
P = R 5 670
i = 0,08 (8 ÷100)
n = 3 years
A = ?

Formula $\quad$ A = P(1+i,n)
$\quad$ = R 5 670 (1+(0.08 x 3))
$\quad$ = R 7 030,80

5A) Information:
P = R 300
i = 0,08 (8 ÷100)
n = (6 months is ,5 years)
n = 1,5 years $(1+\frac{6}{12})$
A = ?

Formula $\quad$ A = P(1+i,n)
$\quad$ = R 300 (1+(0.08 x 1,5))
$\quad$ = R 300 (1+1,58)
$\quad$ = R 300 (2,58)
$\quad$ = R 774

5B) Information:
P = R 2 250
i = 0,125 (12,5 ÷100)
n = 6 years
A = ?

Formula $\quad$ A = P(1+i,n)
$\quad$ = R 2 250 (1+(0,125x 6))
$\quad$ = R2250 (1,75)
$\quad$ = R 3937,50

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6) Information:
P = R 13 000
i = 0,0675 (6,75 ÷100)
n = 5 years
A = ?

Formula $\quad$ A = P(1+i,n)
$\quad$ = R13 000 (1+(0,0675 x 5))
$\quad$ = R13 000 (1+0,3375)
$\quad$ = R13 000 (1,3375)
$\quad$ = R17 387,50

Your Score:

/ 7

Hire Purchase Information

Hire Purchase:

As a general rule, it is not wise to buy items on credit. When buying on credit you have to borrow money to pay for the object, meaning you will have to pay more for it due to the interest on the loan. That being said, occasionally there are appliances, such as a fridge, that are very difficult to live without. Most people don't have the cash up front to purchase such items, so they buy it on a hire purchase agreement.

A hire purchase agreement is a financial agreement between the shop and the customer about how the customer will pay for the desired product. The interest on a hire purchase loan is always charged at a simple interest rate and only charged on the amount owing. Most agreements require that a deposit is paid before the product can be taken by the customer. The principal amount of the loan is therefore the cash price minus the deposit. The accumulated loan will be worked out using the number of years the loan is needed for. The total loan amount is then divided into monthly payments over the period of the loan.

> **IMPORTANT**
>
> Hire purchase is charged at a simple interest rate. When you are asked a hire purchase question, don't forget to always use the simple interest formula.

> **NOTE**
>
> The monthly payment is also called the monthly instalment.

Example:

QUESTION

Troy wants to buy an additional screen for his computer which he saw advertised for $R\,2\,500$ on the internet. There is an option of paying a 10% deposit and then making 24 monthly payments using a hire purchase agreement, where interest is calculated at $7,5\%$ p.a. simple interest. Calculate what Troy's monthly payments will be.

SOLUTION

Step 1: Write down the known variables

A new opening balance is required, as the 10% deposit is paid in cash.

$$10\% \text{ of } 2\,500 = 250$$
$$\therefore P = 2\,500 - 250 = 2\,250$$
$$i = 0,075$$
$$n = \frac{24}{12} = 2$$

Step 2: Write down the formula

$$A = P\left(1 + in\right)$$

Step 3: Substitute the values

$$A = 2\,250\left(1 + 0,075 \times 2\right)$$
$$= 2\,587,50$$

Step 4: Calculate the monthly repayments on the hire purchase agreement

$$\text{Monthly payment} = \frac{2\,587,50}{24}$$
$$= 107,81$$

Step 5: Write the final answer

Troy's monthly payment is $R\,107,81$.

Hire Purchase Worksheet

📖 **Now try it yourself. Answer and show all the calculations in your exercise book.**

1   Angelique wants to buy a microwave on a hire purchase agreement. The cash price of the microwave is R 4 400. She is required to pay a deposit of 10% and pay the remaining loan amount off over 12 months at an interest rate of 9% p.a. (per annum which means per year).

    1A.   What is the principal loan amount?
    1B.   What is the accumulated loan amount?
    1C.   What are Angelique's monthly repayments?

2   A computer costs R 5 999. The shop requires a 10% deposit and the rest will be paid in equal monthly instalments over a three-year period at an interest rate of 14%p.a.
Find the monthly instalments.

3   Sandile buys a dining room table costing R8 500 on a hire purchase agreement. He is charged an interest rate of 17,5% p.a. over 3 years.

    3A.   How much will Sandile pay in total?
    3B.   How much interest does he pay?
    3C.   What is his monthly instalment?

Answers:

1A. First calculate the amount for the deposit:

$$\text{deposit} = R\ 4\ 400 \ \times \frac{10}{100}$$

$$= R\ 440$$

To determine the principal loan amount, we must subtract the deposit amount from the cash price:

$$P = \text{cash price - deposit}$$
$$= R\ 4\ 400 - R440$$
$$= R\ 3\ 960$$

1B. Read the question carefully and write down the given information:

$$A = ?$$
$$P = R\ 3\ 960$$
$$i = 9 \div 100 = 0{,}09$$
$$n = 1$$

To determine the accumulated loan amount we use the simple interest formula:

$$\text{formula} \quad A = P(1+in)$$
$$= R\ 3\ 960\ (1+(0{,}09 \times 1))$$
$$= R\ 4\ 316{,}40$$

1C. To determine the monthly payment amount, we divide the accumulated amount A by the total number of months:

$$\text{Monthly repayment} = \frac{A}{no.\,of\ months}$$

$$= \frac{4316{,}40}{12}$$

$$= R\ 359{,}70$$

2. First calculate the deposit:

$$10\%\ of\ 5999 = R599{,}90$$

Subtract this from the amount owing (because you have already paid it and don't owe as much anymore)

New amount owing is R 5 999 – R 599,90 = R 5 399,10

Secondly, calculate the total amount now owing to the shop after the deposit has been taken off.

$$A = P\ (\ 1 + i.n\ )$$
$$A = R\ 5\ 399{,}10\ (1+ (0{,}14x\ 3))$$
$$= R\ 7\ 666{,}72$$

Divide this amount owing by the number of months in the years to find the monthly repayment.

$$R7\ 666{,}72 \div 36 = R\ 212{,}96$$

Hire Purchase Memo

Answers continued:

3A. The question does not mention a deposit so we assume Sandile did not pay one. We write down the given information and then use the simple interest formula to calculate the accumulated amount:

$$A = ?$$
$$P = R\ 8\ 500$$
$$i = 17,5 \div 100 = 0,175$$
$$n = 3$$

formula
$$A = P(1+in)$$
$$= R\ 8500\ (1+(0,175 \times 3))$$
$$= R\ 12\ 962,50$$

3B. To calculate the total interest paid we subtract the cash price from the accumulated amount.

R12 962,50 - R8 500 = R 14 462,50

3C. To determine the monthly payment amount, we divide the accumulated amount A by the total number of months:

$$\frac{12\ 962,50}{36} = R360,07$$

Your Score:

7

Exchange Rate Information

Different countries have their own currencies. In England, a Big Mac from McDonald's costs £ 4, in South Africa it costs R 20 and in Norway it costs 48 kr. The meal is the same in all three countries but in some places it costs more than in others. If £ 1 = R 12,41 and 1 kr = R 1,37, this means that a Big Mac in England costs R 49,64 and a Big Mac in Norway costs R 65,76.

Exchange rates affect a lot more than just the price of a Big Mac. The price of oil increases when the South African rand weakens. This is because when the rand is weaker, we can buy less of other currencies with the same amount of money.

A currency gets stronger when money is invested in the country. When we buy products that are made in South Africa, we are investing in South African business and keeping the money in the country. When we buy products imported from other countries, we are investing money in those countries and as a result, the rand will weaken. The more South African products we buy, the greater the demand for them will be and more jobs will become available for South Africans. Local is lekker!

Example:

Given the exchange rate: 1$ = R10,47

A)   How many rands will you get for 50$?

Solution: Since the dollar is worth R10,47, 50 dollars will be worth:

50 x R10,47 = R523,50

B)   How many dollars will you get for R50?

Solution: Since we need the R10,47 for one dollar, what we want to know is how many times R10,47 goes into R50. For this we divide R50 by R10,47:

50 ÷ R10,47 = $4,78

Now try it yourself. Answer and show all the calculations in your exercise book.

1. Bridget wants to buy an iPod that costs £100, with the exchange rate currently at £1 = R14. She estimates that the exchange rate will drop to R12 in a month.
a.   How much will the iPod cost in rands, if she buys it now?
b.   How much will she save if the exchange rate drops to R12?
c.   How much will she loose if the exchange rate moves to R15?

2. Study the following exchange rate table:

Country	Currency	Exchange Rate
United Kingdom (UK)	Pounds (£)	R 14,13
United States (USA)	Dollars ($)	R 7,04

a.   In South Africa the cost of a new Honda Civic is R173 400. In England the same vehicle costs £12 200 and in the USA $ 21 900. In which country is the car the cheapest?
b.   Solie and Arinda are waiters in a South African restaurant attracting many tourists from abroad. Sollie gets a £6 tip from a tourist and Arinda gets $12. Who got the better tip?

Exchange Rate Memo

Answers:

1a) Cost in rands = (cost in pounds) x exchange rate

$$= 100 \times \frac{14}{1} = R\ 1\ 400$$

1b) Cost in rands = $100 \times \frac{12}{1}$ = R 1 200

So she will save R 200 (Saving = R 1 400 - R1 200)

1c) Cost in rands = $100 \times \frac{15}{1}$ = R 1 500

So she will loose R 100 (Loss = R 1 400—R 1 500)

2a) To answer this question we work out the cost of the car in rand for each country and then compare the three answers to see which is the cheapest. Cost in rands = cost in currency times exchange rate.

Cost in UK: 12 200 x $\frac{14,13}{1}$ = R 172 386

Cost in USA: 21 900 x $\frac{7,04}{1}$ = R154 400

Cost in RSA given R 173 400

Comparing the three costs we find that the car is the cheapest in the USA.

2b) Sollie: 6 x $\frac{14,13}{1}$ = R 84,78

Arinda: 12 x $\frac{7,04}{1}$ = R 84,48

Therefore Sollie got the better tip. He got 30 cents more than Arinda.

Your Score: / **5**

Fun for the Weekend!!

Riddle 1:

A farmer is travelling with a fox, a goose, and a bag of beans. During his journey, he comes across a river with a boat to cross it.

The farmer can only fit one thing in the boat with him at a time. If left alone together, the fox will eat the goose or the goose will eat the beans.

How does the farmer get everything across the river safely?

Riddle 2:   Divide 30 by ½ and add 10. What's the answer?

Riddle 3:   Your sock drawer only contains 18 white socks and 18 blue socks. How many times do you need to reach inside the drawer and take out a sock to guarantee a matching pair?

Riddle 4:   Using only addition, how can you use eight eights to get the number 1,000?

Riddle 5:   Solve the pattern puzzle below. Find the missing number to replace the question mark.
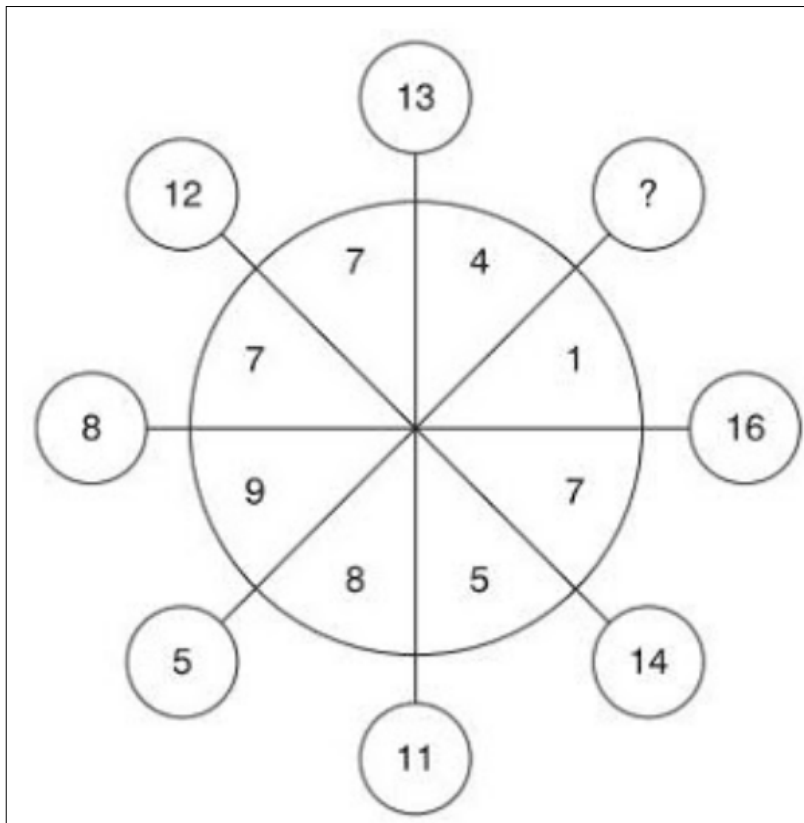
Riddle 1:

a) *Here's the step-by-step solution:*

1.   *The farmer brings the goose across the river first (if he leaves the goose alone, it will either eat the beans or be eaten by the fox).*

2.   *The farmer brings either the fox or the beans across and leaves the other one alone.*

3.   *Now the farmer has two items on the other side of the river, including the goose. If he leaves the goose again, the same problem will occur. So, the farmer must bring the goose back to the other side.*

4.   *The farmer brings the other item back (either the fox or the beans) and leaves the goose alone again. The fox and the beans are now on the other side of the river.*

5.   *The farmer returns and brings the goose across the river again.*

Riddle 2:   *It's 70. You're dividing 30 by ½, not by two. Thirty divided by ½ is the same thing as multiplying it by two, which is 60. Plus 10 makes 70!*

Riddle 3:   *Three times. On the third time, you'll get either a white or a blue sock to match with one of the other two you've already grabbed.*

Riddle 4:   *888 +88 +8 +8 +8*

Riddle 5:   *The missing number is 17. Each number in the circle is the sum of the numbers in the opposite quadrant. In this case, the numbers are eight and nine — added together makes 17 .*

Your Score:

5