*0.
$$00056 = 5.6 \times 0.0001$$
 * 50×10^3
= 5.6×10^{-4} = $5 \times 10^{1+3}$

 $*0.000009 \times 10^{-6} = 0.000009 \times 0.000001$

$$= (9 \times 10^{-6}) \times (1 \times 10^{-6})$$
$$= 9 \times 10^{(-6 + (-6))}$$
$$= 9 \times 10^{-12}$$



 $=5 \times 10^4$

Write these in standard form

* $(2 \times 10^5)^2$ * $(5 \times 10^{-5})^2$ = $(2^2 \times 10^{5 \times 2})$ = (25×10^{-10}) Ans = 4×10^{10} Ans = 2.5×10^{-9} *Ada invests P6000 in an account that earns simple interest. At the end of 3 years, the investment is worth P6810. Calculate the rate of simple interest per year.

(Make R the subject of the formula)

 $SI = \frac{PRT}{100}$ $Rate = \frac{100SI}{PT}$ $Rate = \frac{100 \times 810}{6000 \times 3}$

= 4.5%

*Modiri borrows P70 000 from a bank to buy a car. She agrees to pay back the money in 4 years at 30% interest simple interest per annum.

a) How much interest will she pay?

$$S.I = \frac{Principal \times Point Time}{Principal} = P70\ 000$$

Rate = 30%

Time= 4 years

 $S.I = \frac{P70 \ 000 \times 30 \times 4}{100} = \mathbf{P84} \ \mathbf{000}$ - Modiri will pay an interest of P84 000 b) How much will he pay in total for the car P70 000 + P84 000

=P154 000

We have to find the rate, so we change the subject of the formula to make the rate the subject.

 $Rate = \frac{100S.I}{Principal \times Time}$ $= \frac{100 \times 10\ 000}{55\ 000 \times 2}$

= 9.090909091%

= 9.091%

*Kabelo buys a Mercedes Benz car for P950 000 and the car depreciates at 5% per annum. Calculate the value of the car after 2 years



PAST EXAMINATIONS QUESTIONS

2007, PAPER 3 QUESTION 1

1.A firm increases salaries of employees by 15%. Modiri, Shadi and Patiko are employed by the firm.

(a)Modiri earned P4500 before the increase. How much will he earn after the increase?

 $\frac{15}{100} \times P4500 = P675$

2009 PAPER 3, QUESTION 1

The price list of some food items is written on a piece of paper. Part of the list has been torn as shown below.



(a) What is the cost of 5.25kg of sweets?

P24.60 × 5.25 = P129.15

le.co.uk (b) A customer pays a total of P97 20 for CoRing oil and 2kg of sweets. How many litres of cooking in lie the customer ony?

2kg of sweets P97.20 - P49.20 =

 $\frac{48}{16} = 3$

He bought 3 litres of cooking oil.

(c) The price of a litre of cooking oil is reduced by 20%. What is the new price of a litre of cooking oil?

 $\frac{20}{100} \times P16.00 = P3.20$

P16.00 - P3.20 = P12.80

(i)A photocopier costs P4370 before VAT. Calculate its selling price. $\frac{110}{100}$ × P4370 = **P4807**

Or alternatively

 $\frac{10}{100} \times P4370 = P437$ P4370+P437 = P4807

(ii)A computer is sold at P5998.30. How much does it cost without VAT included?



(b)A salesperson receives 3% of the sales before VAT as commission. Calculate the sales if the person received a commission of P1323.

 $\frac{3x}{100} = 1323$ $3x = 132\ 300$

x= *P44* 100 final answer

2013 PAPER 3, QUESTION 1

A Shopkeeper buys some stock items from a wholesaler. He later sells each item at a profit of 40%.

(a)A pair of shoes was bought at P520 from the wholesaler. For how much should the shopkeeper sell the pair of shoes?

 $\frac{140}{100} \times 520 = P728$

2014 PAPER 3. OI

(b)The shopkeeper sold a T-shirt at P70.00. For how much did the shopkeeper buy the T-shirt from the wholesaler?

x = P50

140 : 70

100: x 140x = 7000

Cattle in calothict are to be calculated for a skin disease. The cattle are to be grouped in batches. There were 85 000 cattle vaccinated in the first batch.

Notesale.co.uk

(a)In the second batch, 20% more cattle were vaccinated than in the first batch. Calculate the total number of cattle that were vaccinated in the second batch.

100 : 85 000

120 : *x*

 $10\ 200\ 000 = 100x$

x= *102 000*

x = 3.125

Exercise

Solve the following equations

a.7(a-3) + 9 = 8(5-a) - 7

- b. 2(x-8) + 14 = 8(x-2) 22
- c. 48 6(5x 2) = 0

d.7 - 2(3a + 5) = 5(1 - 3a)

EXPRESSIONS IN FRACTIONS

 $4 = 5 = \frac{x}{8}$ $4 = 5 = \frac{x}{8}$ $4 = 5 = \frac{x}{8}$ $5 = \frac{x}{8}$ $4 = 5 = \frac{x}{8}$ $5 = \frac{x}{8}$ $4 = 5 = \frac{x}{8}$ $4 = \frac{x}{8}$ $\frac{8x}{40} - \frac{10x}{40} - \frac{15x}{40}$ $=\frac{-17x}{40}$ $*\frac{x-2}{4} + \frac{4-3x}{5}$ $*\frac{3}{r} + \frac{2}{v} = LCM \text{ of } x \text{ and } y \text{ is } xy$ $\frac{3}{x} + \frac{2}{y} = \frac{3y}{xy} + \frac{2x}{yx}$ LCM of 5 and 4 is 20 $\frac{x-2}{4} + \frac{4-3x}{5} = \frac{5(x-2)}{4\times 5} + \frac{4(4-3x)}{5\times 4}$ $\frac{3y+2x}{xy}$ $\frac{5x-10}{20} + \frac{16-12x}{20}$

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*Consider the following sequence



t_1	t_2	<i>t</i> ₃	t4	<i>t</i> 5	t 15		t _n					
1	3	5	7	9								
2×1 - 1	2×2 - 1	2×3 - 1	2×4 - 1	2×5 – 1	2×15 –		2×n – 1					
					1							



*Generate a rule for the sequences given and find the terms asked under each

(a) 64, 56, 48, 40

The table below shows the total number of matchsticks used in a Diagram.

••••••						
Diagram	1	2	3	4		 n
Total number of matchsticks	3	9			•••	

(a)What is the total number of matchsticks in Diagram 3?

18 matchsticks

(b)Find the total number of matchsticks in Diagram 4.



30 matchsticks

(c)Express in terms of *n* the total number of matchsticks in Diagram *n*.

$$2a = 3, a = \frac{3}{2} \qquad 3a + b = 6 \qquad a + b + c = 3$$
$$\frac{9}{2} + b = 6, b = \frac{3}{2} \qquad c = 0$$
$$t_n = \frac{3}{2}n^2 + \frac{3}{2}n$$

(d)
$$\frac{3}{2}n^2 + \frac{3}{2}n - 165 = 0$$



= **74.5**

b)Write an expression for the nth term of the sequence

2a =6, so a = 3
For
$$n = 1$$
, $3(1)^2 + b + c = -3$
 $b + c = -6$
for $n = 2$, $3(2)^2 + 2b + c = 0.5$
 $12 + 2b + c = 0.5$
 $2b + c = -11.5$
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2b + c = -11.5 solve simultaneously b + c = -6

b = 5.5 and c = -0.5 $\therefore t_n = 3n^2 - 5.5n - 0.5$

d)Calculate the value of *n* for which the nth term is 302 $302 = 3n^2 - 5.5n - 0.5$

RATIO AND PROPORTIONS

*Ratios are used to compare quantities

*The simplest form of a ratio has whole numbers with no common factor

Example 1

*Tshepho is 52 years old and her son is 26 years old. We say the ratio of Tshepho's age to her son's age is 52 : 26 = 2 : 1 and the ratio lotesale.co.l of her son's age to hers is 26:52 = 1:2

Example 2

Maipelo is three times of than There and There is half of Tshepho's age of Tshepho is 30 years old, write their age in the ratio Maiped Thero : Tshepla wits simplest form.

Thero is half of 30 years old, which is 15 years and Maipelo is 3 times older than Thero, so she is 45 years old

45:15:30

3:1:2

Example 3

A book costs P450. How much will you need to buy 10 of those books?

 $P450 \times 10 = P4500$

275 + 425 = 700 students

(b) The ratio of the number of students to number of teachers in the school is 25: 1. How many teachers are there in school?

700:25

x : 1

 $\frac{700}{25} = x$, x = 28

28 teachers

