Name: _____

TOPIC TEST

Interest and depreciation

- Time allowed: 45 minutes
- Part A: 20 multiple-choice questions (20 marks)
- Part B: 6 free-response questions (30 marks)

Part A

20 multiple-choice questions
1 mark each: 20 marks
Circle the correct answer.

1 The price P of a lawn mower changed twice. The final price was calculated as $P \times 1.3 \times 0.8$.

This can be described as:

A an increase of 30% then a decrease of 8%

B an increase of 30% then a decrease of 2%

C an increase of 30% then a decrease of 20%

D an increase of 3% then a decrease of 20%

2 The price of a whisper kettle normally selling for $210 is increased by 6%, then decreased at a sale by 9.5%.The correct calculation for the final price is:

A $210 \times 1.6 \times 0.905$

B $210 \times 1.06 \times 0.905$

C $210 \times 1.06 \times 1.095$

D $210 \times 1.06 \times 0.915$

3 Which overall percentage change is equivalent to an increase of 4% followed by a decrease of 2%?

A 2% increase

B 1.92% increase

C 1.92% decrease

D 3.72% increase

4 What is the simple interest earned when $8900 is invested at 4.25% p.a. for 3 years?

A $1134.75

B $113.48

C $11 340.75

D $11 347.50

5 $6600 is invested for 7 months at a flat rate of 3.25% p.a. What is the value of the investment after this period?

A $125.12

B $8101.50

C $6723.20

D $6725.12

6 A principal P earns $284.55 interest when invested at a simple interest rate of 2.9% p.a. for 3 years.

What is the correct calculation for P?

A $P = \dfrac{284.55}{3 \times 0.029}$

B $P = \dfrac{284.55}{3 \times 2.9}$

C $P = \dfrac{3 \times 0.029}{284.55}$

D $P = \dfrac{284.55}{3 \times 0.29}$

7 Frank earned $1508.20 simple interest from an investment of $7650 over 4 years. Calculate the interest rate per annum.

A 0.05%

B 4.93%

C 2.45%

D 4.7%

8 For how long must a sum of $18 000 be invested at 5.4% p.a. simple interest to grow to $24 075?

A 5 years 8 months

B 6 years 4 months

C 6 years 3 months

D 6 years 2.5 months

9 What is the final amount when $6725 is invested for 4 years at 5.75% p.a. compound interest?

A $8271.75

B $8410.34

C $8605.10

D $6881.01

10 What is the final amount when $32 400 is invested for 2 years at 6% p.a. compounded monthly?

A $36 069.11

B $36 404.64

C $36 519.98

D $36 466.49

11 This compound interest table shows the final value (in dollars, correct to three decimal places) when $1 is invested for six periods at various interest rates per compounding period. Calculate the value of A.

Number of periods	1%	5%	7%	9%	10%
6	1.062	1.340	1.500	A	1.772

A 1.677

B 1.540

C 1.654

D 1.729

12 Use the table from question **11** to find the final value when $4300 is invested for 6 years at 5% p.a. compounded yearly.

A $4566.60

B $6480

C $5762

D $5815

13 What amount needs to be invested at 3.2% p.a. compounded annually for 3 years to give a future value of $15 000?

A $12 976

B $13 674.47

C $13 848.21

D $13 647.47

14 A salary of $56 400 increases by 2.7% p.a. By how much has the salary increased after 4 years?

A $6342.36

B $62 742.36

C $6091.20

D $6519.30

15 $14 300 is invested at 3.5% p.a. for 2 years, interest compounded half-yearly. Calculate the final value of the investment.

A $15 318.51

B $15 327.58

C $15 301

D $15 400

16 The table shows compounded values of $1. What is the final value when $3000 is invested at 4% p.a. for 3 years with interest compounded half-yearly?

	Compounded Values of $1		
	Interest rate per period		
Periods	1%	2%	4%
1	1.01	1.02	1.04
2	1.0201	1.0404	1.0816
3	1.0303	1.0612	1.1248
4	1.0406	1.0824	1.1698
5	1.051	1.1041	1.2166
6	1.0615	1.1262	1.2653

A $3374.40

B $3795.90

C $3378.60

D $3183.60

17 A principal of $5000 is to be invested for 8 years. Which of the following is the best investment option?

A 7% p.a. simple interest

B 6% p.a. compounded annually

C 5.4% p.a. compounded monthly

D 5.6% p.a. compounded quarterly

18 A car was purchased for $22 990 and depreciated to $18 600 after three years under straight-line depreciation. What was the annual depreciation?

A $1465.33

B $1460

C $1463.33

D $4390

19 A vehicle purchased for $44 000 depreciated by the straight-line depreciation method. It had lost $12 600 value after 4 years. What is the vehicle worth after 7 years?

A $18 800

B $14 600

C $22 050

D $21 950

20 A motorcycle is purchased for $23 000 and depreciates by $3100 each year. When, will the motorcycle have $0 salvage value?

A 7 years 4 months

B 7 years 5 months

C 7 years 2 months

D 7 years 6 months

Part B

6 free-response questions
30 marks
Show your working where appropriate.

21 Indira's electricity bill issued in March 2016 recorded a daily electricity usage of 9.375 kWh. Her daily usage had increased by 4% on the March 2017 bill and then decreased by 12.51% on the March 2018 bill.

a Calculate her daily usage on the March 2017 bill.

b Calculate her daily usage on the March 2018 bill, correct to 2 decimal places.

c What is the overall percentage change in daily usage, correct to 2 decimal places?

d What is the overall change in usage from March 2016 to March 2018?

[6 marks]

22 Sienna earned $78.06 simple interest from an investment of $3840 over 120 days. What was the interest rate per day, correct to three decimal places?

[3 marks]

23 An amount of $12 500 was invested for 2 years simple interest and grew to $14 230. Calculate the monthly interest rate.

[3 marks]

24 The final value of an investment after six years at 5.5% p.a. compounded annually is $12 892.18.

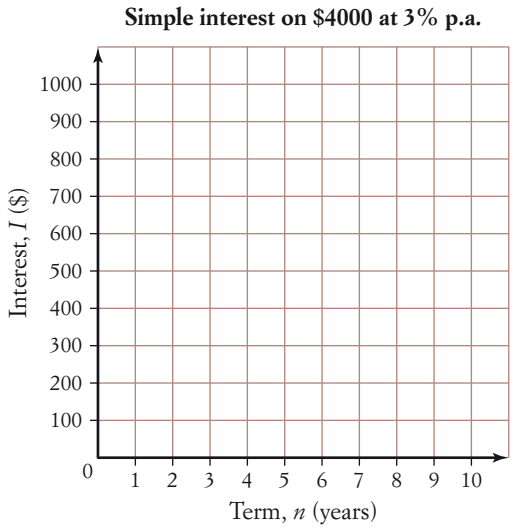
a What principal was invested?

b How much interest was earned?

[4 marks]

25 A principal of $4000 is invested in an account that earns 3% p.a. simple interest.

a Construct a graph that shows the simple interest, I, earned in dollars for n years, for values of n from 0 to 8.



b What is the gradient of the line and what does it represent?

c Use the graph to estimate the simple interest earned after $3\frac{1}{2}$ years. (Show your working on the graph).

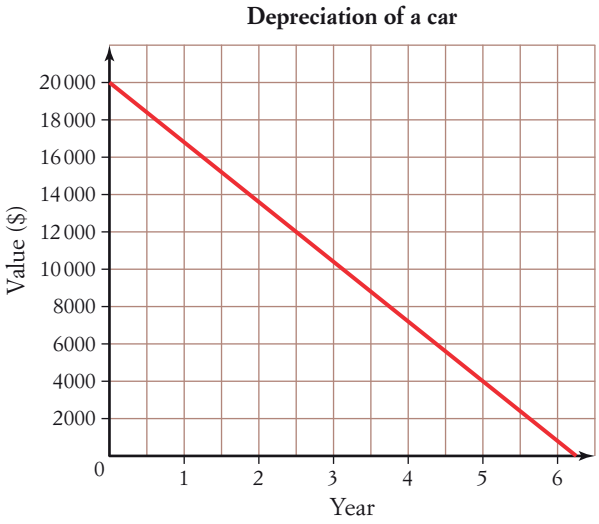
d Use the graph to estimate when $900 in interest will be earned. (Show your working on the graph).

e On the same graph, draw a line that shows the simple interest earned if the rate is changed to 5% p.a.

f Use your graph to calculate how much more interest is earned after 4 years at the higher rate.

[8 marks]

26 The graph below shows the depreciation of a car over its useful life.



a What was the purchase price of the car?

_____

b What was the salvage value of the car after five years?

_____

c What does the gradient of the line represent?

_____

d What is the annual depreciation?

_____

e How long did it take for the car to lose 40% of its purchase price?

_____

[6 marks]

This is the end of the test.

Answers

Part A

1	C	**2**	B	**3**	B	**4**	A
5	D	**6**	A	**7**	B	**8**	C
9	B	**10**	C	**11**	A	**12**	C
13	D	**14**	A	**15**	B	**16**	C
17	B	**18**	C	**19**	D	**20**	B

Part B

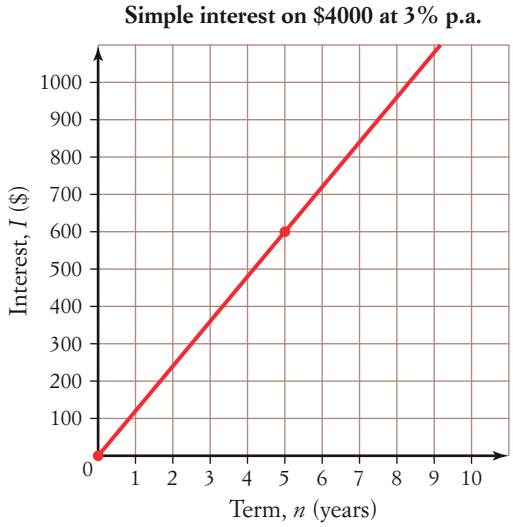
21 **a** 9.75 kWh
b 8.53 kWh
c decrease of 9.01%
d 0.845 kWh

22 0.017%

23 $0.57\dot{6}\%$

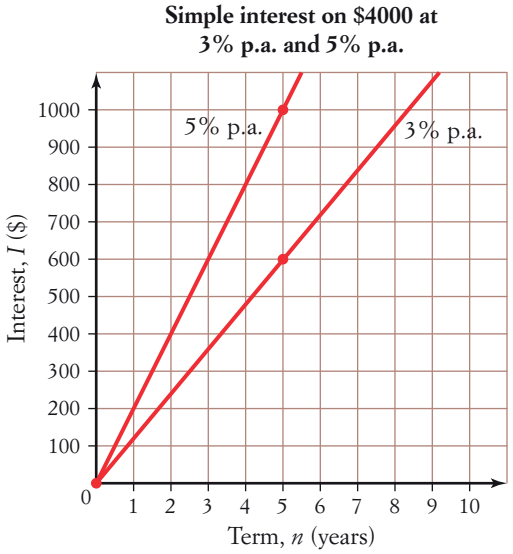
24 **a** \$9350
b \$3542.18

25 **a**



b 120, the simple interest earned per year.
c \$420
d $7\frac{1}{2}$ years

e



f \$320

26 **a** \$20 000
b \$4000
c Amount of depreciation per year
d \$3200
e $2\frac{1}{2}$ years