NEW CENTURY MATHS 11
MATHEMATICS STANDARD (PATHWAY 2)

FULLY WORKED SOLUTIONS

Practice paper 3

Section 1

Question 1

$P = 25\ 000,\ r = 0.035,\ n = \frac{7}{12}$

$I = Prn$

$= 25\ 000 \times 0.035 \times \frac{7}{12}$

$= 510.416...$

≈ 510.42

$\therefore$ B

Question 2

465 km = 4.65 lots of 100 km

Fuel consumption $= 50\text{ L} \div 4.65$

$= 10.75...$

≈ 10.8

$\therefore$ D

Question 3

$\$41.40 \times 12 = \$496.80$ per year

Savings $= \$496.80 - \$399$

$= \$97.80$

$\therefore$ B

Question 4

$T = kM$

$10 = k \times 4$

$\frac{10}{4} = k$

$k = 2.5$

$\therefore T = 2.5M$

$= 2.5 \times 5$

$= 12.5$

$\therefore$ C

Question 5

y-intercept = 3

$\text{Gradient} = \frac{\text{rise}}{\text{run}}$

$= \frac{3}{1}$

$= 3$

$\therefore y = mx + c$

$= 3x + 3$

$\therefore$ D

Question 6

\$39 450 rounds up to \$39 500 to the nearest hundred.

$\therefore$ Stamp duty $= \$395 \times \$3$

$= \$1185$

$\therefore$ A

Question 7

$A = 24\ 000,\ r = 0.057,\ n = 6,$ compounded yearly

$$A = P(1+r)^n$$
$$24\ 000 = P(1+0.057)^6$$
$$24\ 000 = P \times 1.3946...$$
$$\frac{24\ 000}{1.3946...} = P$$
$$P = 17\ 209.2252$$
$$\approx \$17\ 209.23$$

$\therefore$ D

Question 8

$I = 13\ 800 - 12\ 000 = 1800,\ P = 12\ 000,\ n = 2$

$$I = Prn$$
$$1800 = 12\ 000 \times r \times 2$$
$$1800 = 24\ 000 \times r$$
$$\frac{1800}{24\ 000} = r$$
$$r = 0.075$$
$$r = 7.5\%$$

$\therefore$ A

Question 9

$x_1\ y_1 \qquad x_2\ y_2$

(3, 5) and (8, 11)

$$\text{Gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{11-5}{8-3}$$
$$= \frac{6}{5}$$

$\therefore$ C

Question 10

100% – 35% = 65%

$$65\% \text{ of } \$87\ 600 = 0.65 \times \$87\ 600$$
$$= \$56\ 940$$

$\therefore$ A

Section 2

Question 11

a **i** $V_0 = \$32\ 000,\ D = \$3500,\ n = 3\frac{1}{2}$

$S = V_0 - Dn$

$= 32\,000 - 3500 \times 3\frac{1}{2}$

$= \$19\,750$

$\therefore$ Its value will be $19 750.

ii $S = \$4000,\ V_0 = \$32\ 000,\ D = \$3500$

$S = V_0 - Dn$

$4000 = 32\,000 - 3500 \times n$

$-28\ 000 = -3500n$

$\frac{-28\ 000}{-3500} = n$

$n = 8$

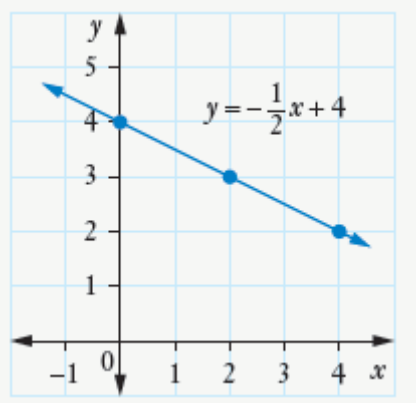
$\therefore$ It will take 8 years for the car's value to be $4000.

b **i** Using $y = mx + c$

Gradient $= -\frac{1}{2}$

y-intercept $= 4$

ii



c **i**

20 000: 3% of 20 000 = $600

30 000: 3% of 30 000 = $900

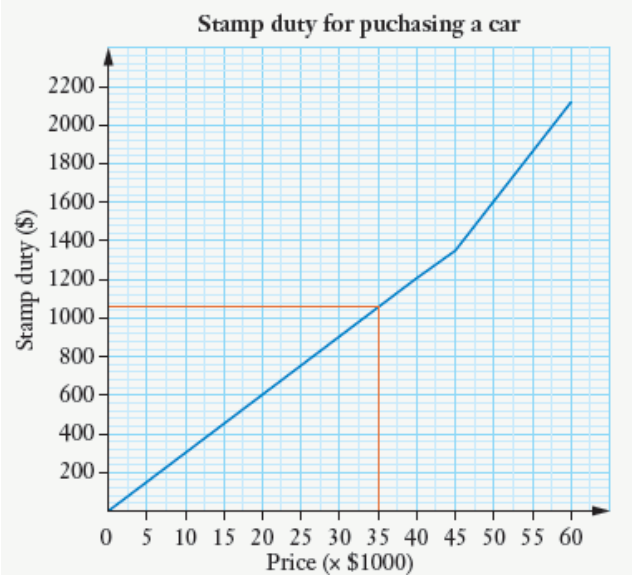
40 000: 3% of 40 000 = $1200

45 000: 3% of 45 000 = $1350

50 000: 3% of 45 000 + 5% of 5000 = $1350 + $250
= $1600

60 000: 3% of 45 000 + 5% of 15 000 = $1350 + $750
= $2100

ii



iii $1050

Question 12

a CTP insurance protects owners/drivers from legal liability for personal injury or death to any other person, while third party property insurance is optional and covers damage to other vehicles and property where you are at fault. It does not cover damage to your vehicle.

b **i** decreasing by 5.5 L/h

$\therefore$ started with $73 + 2 \times .5 = 84$ L

$\therefore V = -5.5t + 84$

ii The decrease in water volume in kilolitres per hour.

iii The amount of water in the pool before you start draining it.

iv Drained completely means $V = 0$.

$$0 = -5.5t + 84$$

$$5.5t = 84$$

$$t = \frac{84}{5.5}$$

$$= 15.27...$$

$$\approx 15.3 \text{ h}$$

$\therefore$ It will be 15.3 hours.

c **i** $I = 4\%$ of \$15 000

$$= 0.04 \times \$15\,000$$

$$= \$600$$

$\therefore$ Interest earned in first year was \$600.

ii $\$15\,000 + \$600 = \$15\,600$ is the principal at the beginning of the second year.

iii $I = 4\%$ of \$15 600

$$= 0.04 \times \$15\,600$$

$$= \$624$$

$\therefore$ Interest earned in second year was \$624.

iv $\$600 + \$624 = \$1224$ interest in two years.

Question 13

a **i**

$x_1 \ y_1 \qquad x_2 \quad y_2$

(3, 50) and (30, 500)

$$\text{Gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{500 - 50}{30 - 3}$$
$$= \frac{450}{27}$$
$$= \frac{50}{3}$$

ii $y = mx + c$

$$D = \frac{50}{3} f + 0$$
$$D = \frac{50}{3} f$$

iii If $D = 900$,

$$900 = \frac{50}{3} f$$
$$2700 = 50 f$$
$$54 = f$$

$\therefore$ The amount of fuel used would be 54 L.

b $\text{GST price} = 110\% \times \$48\ 250$

$= \$53075$

For stamp duty, round price up to nearest \$1000: \$53 100

Stamp duty:

\$1350 + 0.05 × (\$53 100 – \$45 000) = \$1755

$\therefore$ On road costs $= \$53075 + \$1755 + \$736 + \$387 + \$682$

$= \$56\ 635$

c **i** Distance = $47 \times 10 = 470$ km

$$\text{Amount petrol} = \frac{470 \text{ km}}{100} \times 8.4$$
$$= 39.48 \text{ L}$$

$\therefore$ Robyn would use 39.48 L.

ii $\text{Amount petrol} = \frac{150 \text{ km}}{100} \times 8.4 = 12.6$ L

$\therefore \text{Total petrol} = 39.48 + 12.6$

$= 52.08$ L

$\therefore \text{Cost} = 52.08 \times 145.9$ c/L

$= 7598.472$ c

$= \$75.98472$

$\approx \$75.98$

$\therefore$ Her weekly fuel bill will be \$75.98.

