

GENERAL TRIAL 2011.

MULTIPLE CHOICE.

1. B

2. B

3. A

4. A

5. C

6. D

7. D

8. A

9. D

10. C

11. B

12. B

13. B

14. D

15. A

16. D

17. A

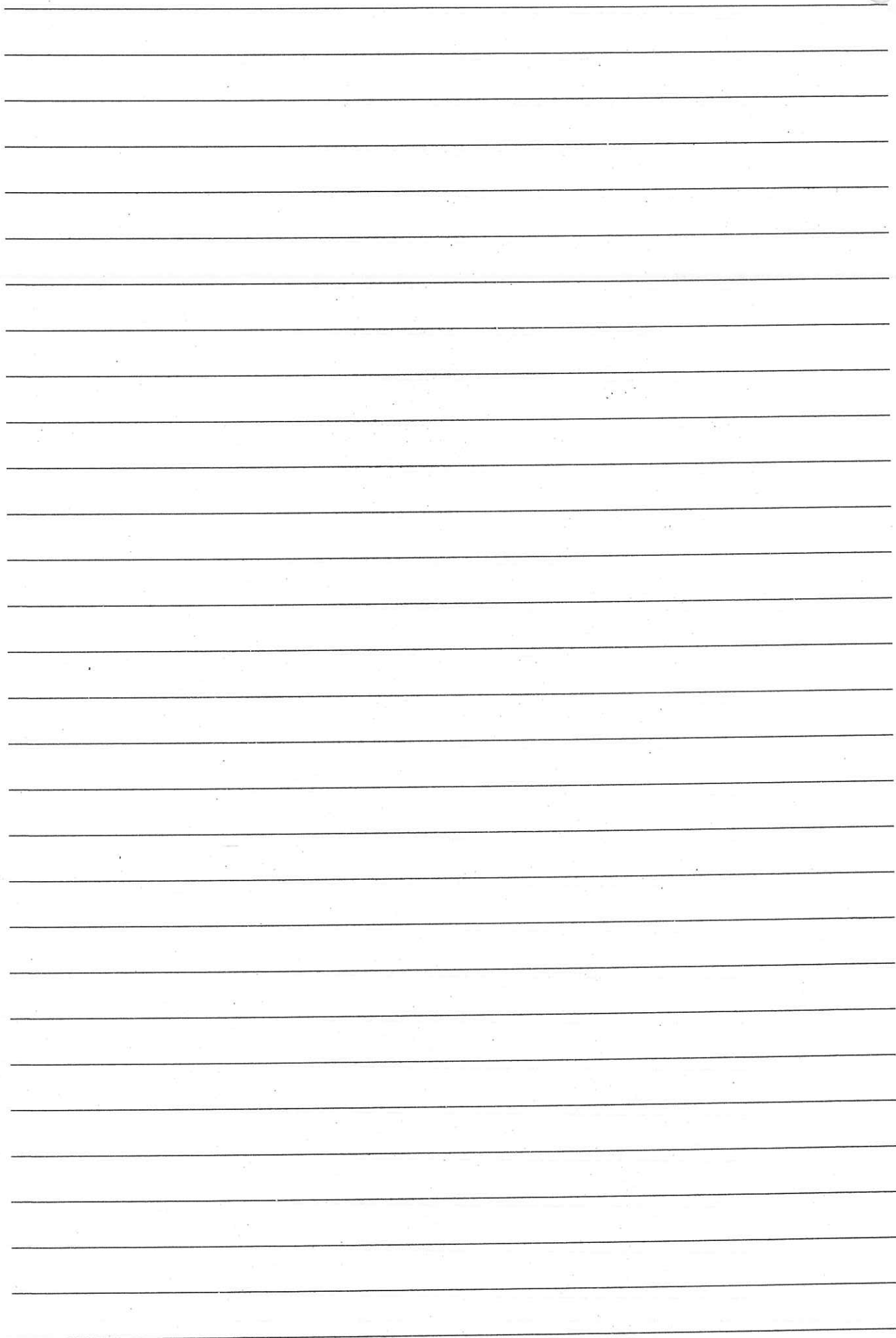
18. A

19. A

20. C

21. A

22. C



SECTION 2. (YR 12 GENERAL TRIAL 2011)

QUESTION 23 (13 marks)

a) $C = \sqrt{\frac{2.3}{2.3+5.1}}$
 $= \sqrt{\frac{2.3}{7.4}}$

$= 0.55750...$ ✓

$= 0.558$ (3 dp) ✓

b) $\frac{mn^2}{3} \times \frac{5q}{n} = \frac{mn}{3}$ ✓✓

c) i) Town A, November = 24°C ✓

ii) During September & April
towns have same temp. ✓

iii) 6 complete months temp
town A > temp town B ✓

iv) the difference in temp of
town A to town B is
increasing from Dec → Feb ✓

d) i) $A = 59 - 27 = 32$ ✓ $B = 71 + 58 = 129$ ✓

ii) $\frac{\text{play bball}}{\text{year group}} = \frac{71}{129}$ ✓

iii) $\frac{\text{male dont play}}{\text{total dont play}} = \frac{26}{58}$
 $= 44.8\%$ ✓

iv) $\frac{\text{females play bball}}{\text{females}} \times 100$
 $= \frac{27}{59} \times 100$

$= 45.76...$

$= 45.8\%$ ✓

=

no rounding

QUESTION 24. (13 marks)

$$\begin{aligned} \text{a) } A &\doteq \frac{10}{3} \left\{ (0 + 4 \times 8 + 12) + (12 + 4 \times 11 + 0) \right\} \checkmark \\ &\doteq \frac{10}{3} \{ 44 + 56 \} \\ &\doteq 333 \frac{1}{3} \text{ m}^2 \quad \checkmark \end{aligned}$$

b) (i) Gross pay = \$1400 per fortnight

Deductions per fortnight:

$$\text{tax} = \$243.16$$

$$\text{union} = \$9.78 \times 2$$

$$\text{health} = \frac{52.80 \times 12}{26}$$

$$\text{TOTAL} = \$287.09 \text{ (2 dp)} \quad \checkmark$$

$$\begin{aligned} \therefore \text{Net pay} &= \$1400 - 287.09 \quad \checkmark \\ &= \$1112.91 \end{aligned}$$

(iii) 4 weeks Gross pay \times 0.175

$$= 0.175 \times 2 \times 1400 \quad \checkmark$$

$$= \$490 \quad \checkmark$$

C. (i) 115% = €220

$$1\% = \frac{44}{23} \text{ (1.91...)}$$

$$100\% = €191.30 \text{ (2 dp)} \quad \checkmark$$

(ii) $x = €220$

$$1 = €0.62$$

$$x = 220 \div 0.62$$

$$= \$354.84 \text{ (2 dp)} \quad \checkmark$$

QUESTION 24 (CONT.)

d) i) depreciation over 5 years

$$= 2500 - 1000$$

$$= 1500$$

$$\text{per year} = \frac{1500}{5}$$

$$= \$300 \quad \checkmark$$

(ii) $S_v = 2500 - 300n \quad \checkmark \checkmark$

(iii) $S_v = 1500$

$$1500 = 2500 - 300n \quad \checkmark$$

$$\neq 1000 = n$$

$$n = \frac{1000}{300} \text{ years}$$

$$= 3 \text{ years } 4 \text{ months } \checkmark$$

QUESTION 25 (13 marks)

a) time difference: 1345 and 1115

$$= 2.5 \text{ hours}$$

$$2.5 \times 15 = 37.5^\circ \quad \checkmark$$

b) absolute error = 0.5 cm

$$\% \text{ error} = \frac{0.5}{16.8} \times 100 \quad \checkmark$$

$$= 0.2976 \dots$$

$$= 0.298 \% \text{ (3 sig fig)} \quad \checkmark$$

c) $\sqrt[3]{x+3} = 8$

$$x+3 = 8^3 \quad \checkmark$$

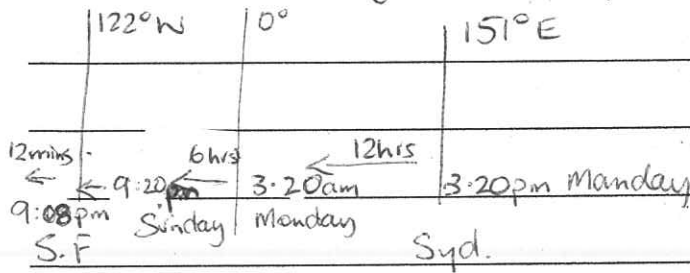
$$x = 512 - 3$$

$$x = 509 \quad \checkmark$$

Question 25 (cont.)

d) Sydney ($34^{\circ}\text{S } 151^{\circ}\text{E}$)

San Francisco ($37^{\circ}\text{N } 122^{\circ}\text{W}$)



longitude difference = 273°

time difference = 1095 mins

= 18 hrs 12 mins

Sydney is ahead 18 hrs 12 mins

SF → 9:08 pm Sunday ✓✓ July 10

e) $\frac{16}{50} = \frac{400}{\pi}$ ✓

$\pi = \frac{50 \times 400}{16}$

$\pi = 1250$ ✓

f) (i) Area ABCE

$A_{ABE} = \frac{1}{2} \times 40 \times 34 \times \sin(17+68)$

= $20 \times 34 \times \sin 85$

= 677.41...

$A_{BEC} = \frac{1}{2} \times 30 \times 34 \times \sin(129-68)$

= $15 \times 34 \times \sin 61$

= 446.06

$A_T = 1123.47 \text{ m}^2$

= 1123.5 m^2

(ii) $BC^2 = 30^2 + 34^2 - 2 \times 30 \times 34 \times \cos 61$

$BC^2 = 1066.985...$

= 32.66

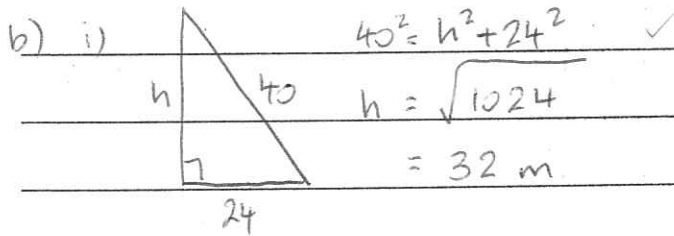
= 33m (nearest)

QUESTION 26 (13 marks)

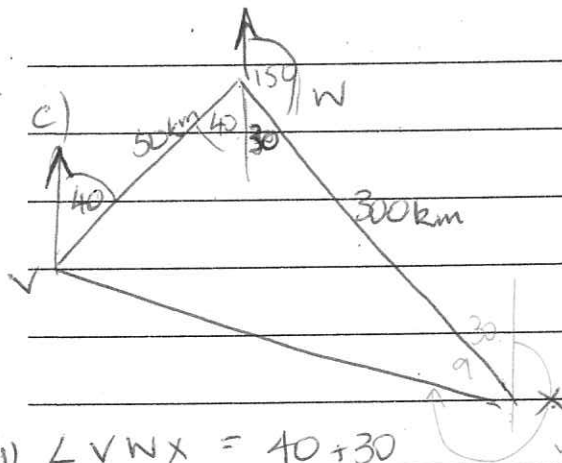
a) Rome 42°N , Berlin 52°N

\angle difference $52^\circ - 42^\circ = 10^\circ$ ✓

$$\begin{aligned}d &= 2 \times \pi \times r \times \frac{\theta}{360} \\ &= 2 \times \pi \times 6400 \times \frac{10}{360} \\ &= 1117.01\dots \\ &= 1120 \text{ km (nearest 10 km)} \checkmark\end{aligned}$$



ii) $V = \frac{1}{3} \pi r^2 h$
 $= \frac{1}{3} \pi \times 24^2 \times 32$
 $= 19301.94526 \text{ m}^3$ ✓
 $= 19301945.26 \text{ L}$
 $= 19\,301.94 \text{ KL}$
 $= 19\,302 \text{ KL}$ ✓



(40° from alternate \angle
 30° from straight \angle)

QUESTION 26 (LONT)

$$\text{ii) } d_{vx}^2 = 50^2 + 300^2 - 2 \times 50 \times 300 \times \cos 70 \quad \checkmark$$
$$= 82239.3957$$

$$d_{vx} = 286.774 \dots \quad \checkmark$$

iii) find $\angle NXV$

$$\frac{\sin X}{50} = \frac{\sin 70}{286.774 \dots}$$

$$\sin X = \frac{50 \times \sin 70}{286.774 \dots}$$

$$= 9^\circ \text{ (nearest)} \quad \checkmark$$

$$\text{Bearing: } 360 - (30 + 9)^\circ$$

$$= 321^\circ \text{ (True)} \quad \checkmark$$

d) i) \$7500 from graph \checkmark

$$\text{ii) } m = \frac{9000 - 3000}{39000 - 21000}$$

$$= \frac{6000}{18000}$$

$$= \frac{1}{3} \quad \checkmark$$

iii) Tax rate between \$21000 and \$39000

$$= \frac{1}{3} \times 1.00$$

$$= 33\frac{1}{3} \text{ cents per dollar}$$

\therefore 66.7 cents per dollar

is available after tax

QUESTION 27

a) order NOT important.

$$\frac{10 \times 9 \times 8 \times 7}{4 \times 3 \times 2 \times 1}$$

or ${}^{10}C_4 = 210$ ✓ 1

b) i) } door

☒ shower

▭ bath

▭ toilet

▭ double vanity

tiled floor

ii) 16.6 m ✓ 1

iii) bedroom 2 = 3600×2700
 $= 3.6 \times 2.7$ m

Carpet 1.8 m wide

∴ 2×2.7 required

∴ cost = $2 \times 2.7 \times 268.80$ ✓
 $= \$1435.32$ 2

(including cupboard) ✓

c) i) 35 ✓ 1

ii) $\bar{x} = \frac{616}{30}$

$= 20.53$ ✓ 1

iii) max = 35

$Q_3 = 26$

$M_d = 17.5$ } 2

$Q_1 = 12$

min = 6

QUESTION 27 (CONT)

iv) 1. $IQR = 26 - 15$

$= 11$

✓ ①

2. on paper

3. femals have a -ve skew }

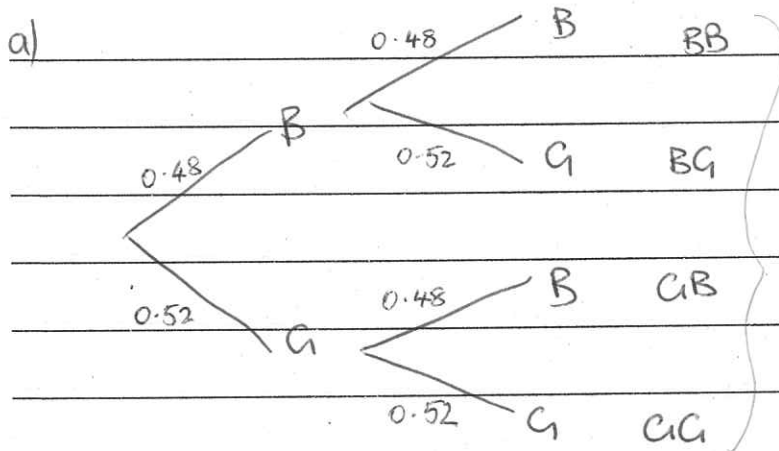
OR males have a +ve skew } ①

OR range for males smaller

OR IQR for female smaller.

QUESTION 28. (13 marks)

First Child 2nd Child SS



(i) $P(GG) = 0.52 \times 0.52 = 0.2704$ ✓

$P(\text{at least one boy}) = P(\overline{GG})$

$= 1 - 0.2704$

$= 0.7296$ ✓ 1

b) i) $C = 32n$ ✓ 1

ii) $C = 0.15 \times 32n + 680$ ✓

$= 4.8n + 680$ ✓ 2

iv) on paper 2

iv) point of intersection is

the break even point; ✓ 1

the number of consultations makes it worthwhile to have insurance.

QUESTION 28 (CONT)

c) i) decrease of \$12. ✓ 1

ii) $0.3 \times 6250 = \$1875$. ✓ 2

she must earn \$1942. ✓

∴ her application would
be rejected.

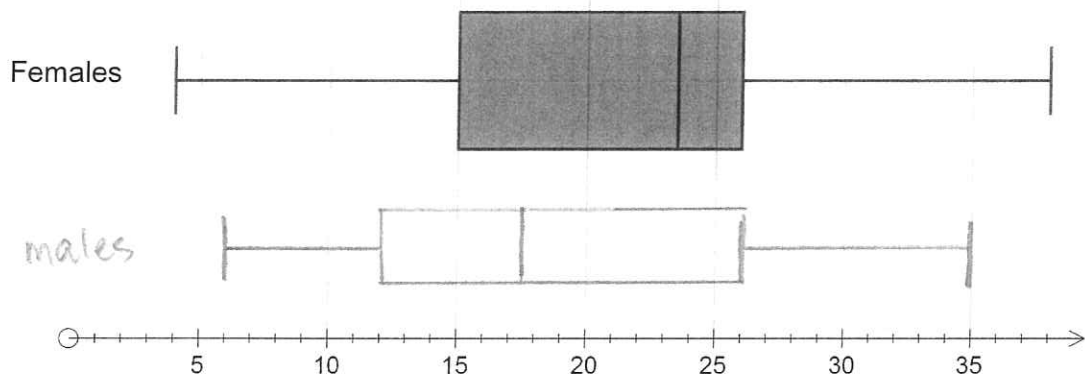


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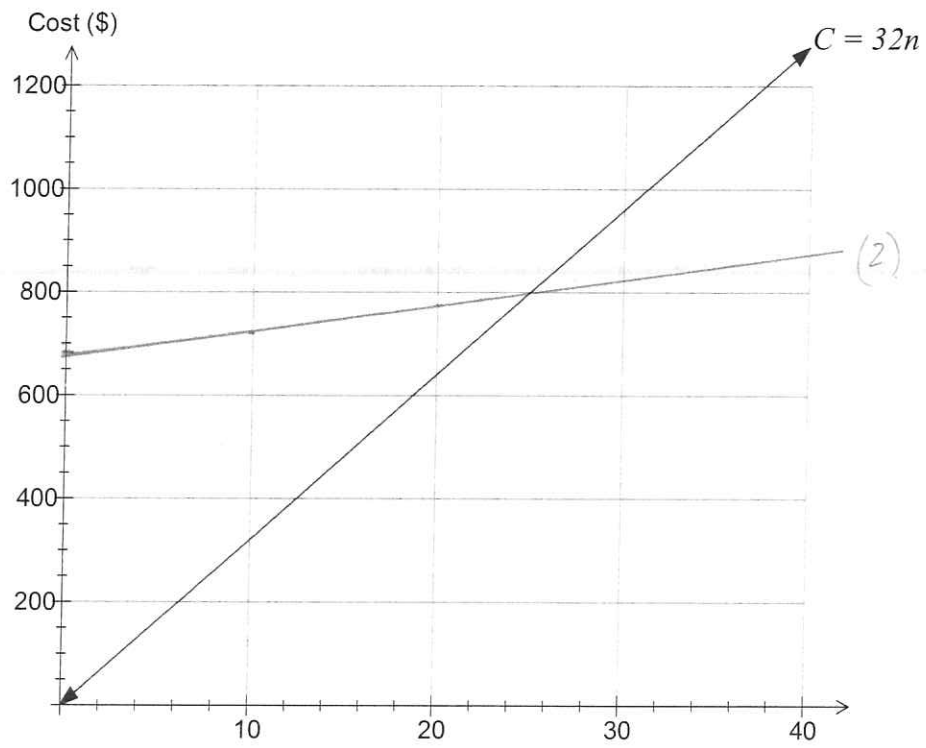
Answer sheet to Question 27 c) iv) 2)

Attach this sheet to your Question 27 Answer Booklet

Marks in a Mathematics Test



Answer sheet to Question 28 b ii



Number of Medical Consultations (n)