

**Provincial Department of Education
Northern Province
Provincial Level Year End General Exam - 2013
Grade :- 11 Mathematics - II Marking scheme**

Part A Answers

01)

a) $\frac{10}{100} \times \text{Rs } 50,000$
 $= \text{Rs } 5000$ 1Mark

b) $\text{Rs } 50\,000 - \text{Rs } 5000$
 $= \text{Rs } 45,000$ 1Mark

c) $\frac{\text{Rs } 45,000}{9}$
 $= \text{Rs } 5000$ 1Mark

d) $\frac{\text{Rs } 5000 \times \frac{1}{12} \times 24}{100}$
 $= \text{Rs } 100$ 2Marks

e) $\frac{9 \times 10}{2} = 45$ 2Marks

f) Total interest = $45 \times \text{Rs } 100$
 $= \text{Rs } 4500$ 1Mark

Monthly installment = $\frac{45,000 + 4500}{9}$
 $= \text{Rs } \frac{49500}{9}$
 $= \text{Rs } 5,500$ 2Marks

02) a) i) (-1) 1Mark

ii) Drawing graph 3Marks

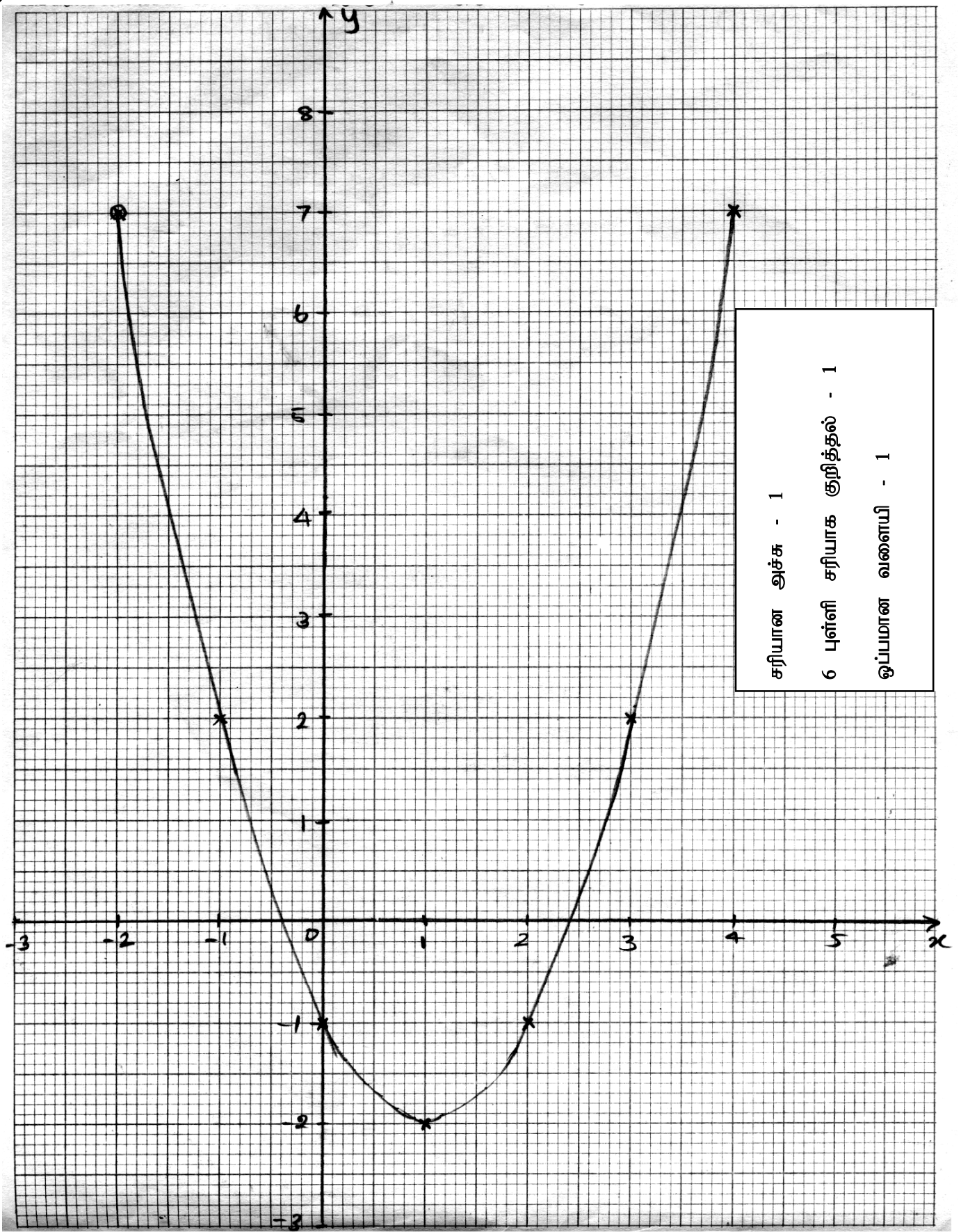
b) i) (-2) 1Mark

ii) $x = 1$ 1Mark

iii) $1 < x < 4$ 1Mark

iv) $(x - 1)^2 - 2 = y$
 $x^2 - 2x + 1 - 2 = y$
 $y = x^2 - 2x - 1$
 $0 = x^2 - 2x - 1$
 $y = 0$
 Solutions = -0.4, 2.4 2Marks

(v) $y = (x + 1)^2 + 2$ 1Mark



03) a) i) $3x + 2y = 170$ 1Mark

$4x = 3y$ 1Mark

ii) $3x + 2y = 170$①

$4x - 3y = 0$②

① x 3 $9x + 6y = 510$③

③ x 2 $8x - 6y = 0$④

③ + ④ $17x = 510$

$x = 30$ 2Marks

$x = 30 \Rightarrow$ ② \Rightarrow

$4x = 3y$

$3y = 4 \times 30$

$3y = 120$

$y = 40$ 2Marks

$x = 30$

$y = 40$

[Note:- For direct answer (1) + (1) Marks]

iii) Cost of two pine apples = Rs 120

Cost of one pine apple = Rs 60 2Marks

b) $x^2 - 4 - x - 2$

$= x^2 - 2^2 - (x + 2)$

$= (x + 2)(x - 2) - (x + 2)$

$= (x + 2)(x - 2 - 1)$

$= (x + 2)(x - 3)$ 2Marks

04) a) $\frac{x+3}{3} + \frac{x+2}{6} = \frac{7}{3}$

$\frac{2(x+3)+x+2}{6} = \frac{7}{3}$

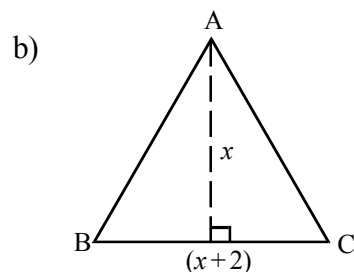
$\frac{2x+6+x+2}{6} = \frac{7}{3}$

$(3x+8) = \frac{7 \times 6}{3}$

$3x + 8 = 14$

$3x = 6$

$x = 2$ 3Marks



i) $\frac{1}{2} \times (x + 2) \times x$

$= \frac{x(x+2)}{2}$

$= \frac{x(x+2)}{2}$ 1Mark

ii) $\frac{x^2 + 2x}{2} = 5$

$x^2 + 2x = 10$

$x^2 + 2x - 10 = 0$ 1Mark

c) $x^2 + 2x - 10 = 0$
 $x^2 + 2x = 10$
 $x^2 + 2x + 1 = 10 + 1$ 1Mark
 $(x+1)^2 = 11$ 1Mark
 $x + 1 = \pm \sqrt{11}$ 1Mark
 $x = -1 \pm 3.31$
 (+) $x = 2.31$
 (-) $x = (-4.31)$ 2Marks
 OR

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ 1Mark

$x = \frac{-2 \pm \sqrt{2^2 - 4 \times 1 \times (-10)}}{2 \times 1}$ 1Mark

$= \frac{-2 \pm \sqrt{4 + 40}}{2}$

$= \frac{-2 \pm \sqrt{44}}{2}$ 1Mark

$= \frac{2(-1 \pm \sqrt{11})}{2} = -1 \pm 3.31$

$x = 2.31$ Or (-4.31) (1)+(1) Mark

05) a)

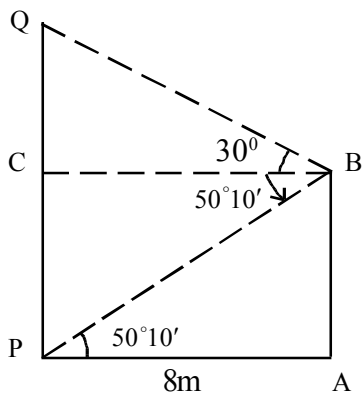


Diagram - 1Mark

a) i) $\tan 50^\circ 10' = \frac{AB}{AP}$ 1Mark

$AB = AP \times \tan 50^\circ 10'$
 $AB = 8 \text{ m} \times 1.1988 = 9.5904 \text{ m}$
 $AB = 9.59 \text{ m}$ 1Mark

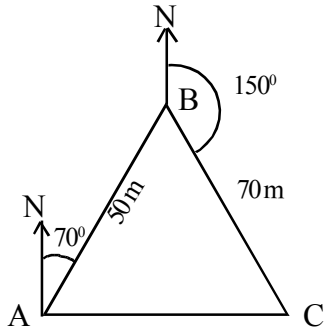
ii) $\tan 30^\circ = \frac{QC}{BC}$ 1Mark

$QC = BC \times \tan 30^\circ$
 $= 8 \text{ m} \times 0.5774 = 4.6192 \text{ m}$
 $= 4.62 \text{ m}$ 1Mark

$PQ = PC + CQ$
 $= 9.59 \text{ m} + 4.62 \text{ m} = 14.21 \text{ m}$ 1Mark

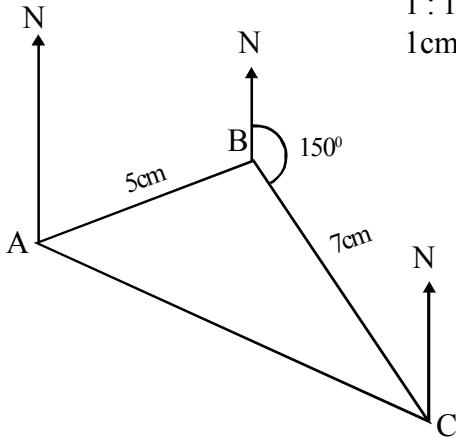
b)

i)



rough diagram 1 Mark

ii)



1 : 1000
1cm => 10m

Scale diagram 1 Mark

a) 330° 1Mark

b) $AC = 9.2 \times 10m$
 $= 92m$ 1Mark

Part B Answers

06) a)

i) Volume of cylinder $= \pi r^2 h$
 $= \pi \times a^2 \times 4a$
 $= 4\pi a^3$ 1Mark

ii) Volume of cone $= \frac{1}{3} \pi r^2 h$
 $= \frac{1}{3} \times \pi \times a^2 \times a$
 $= \frac{1}{3} \pi a^3$ 1Mark

iii) Volume of remaining solid $= 4\pi a^3 - \frac{1}{3} \pi a^3$
 $= \frac{12\pi a^3 - \pi a^3}{3}$
 $= \frac{11}{3} \pi a^3$ 2Marks

$$b) \quad x = \frac{0.835 \times \sqrt{64.36}}{(2.83)^2}$$

$$\lg x = \lg \frac{0.835 \times \sqrt{64.36}}{(2.83)^2}$$

$$= \lg 0.835 + \frac{1}{2} \lg 64.36 - 2 \lg 2.83 \dots\dots\dots 1\text{Mark}$$

$$= \bar{1}.9217 + \frac{1}{2} \times 1.8086 - 2 \times 0.4518 \dots\dots\dots 2\text{Marks}$$

$$= \bar{1}.9217 + 0.9043 - 0.9036 \dots\dots\dots 1\text{Mark}$$

$$\lg x = \bar{1}.9224$$

$$x = \text{Antilog } \bar{1}.9224$$

$$x = 0.8352 \dots\dots\dots 1\text{Mark}$$

$$x = 0.84 \dots\dots\dots 1\text{Mark}$$

07) a) i) 3 Match sticks 1Mark

ii) $T_n = a + (n-1)d$ 1Mark

$$T_8 = 8 + (8 - 1) \times 3 \dots\dots\dots 1\text{Mark}$$

$$= 8 + 7 \times 3$$

$$= 8 + 21$$

$$= 29 \dots\dots\dots 1\text{Mark}$$

29 Match sticks.

iii) $S_n = \frac{n}{2} [2a + (n - 1)d]$ 1Mark

$$S_{15} = \frac{15}{2} [2 \times 8 + (15 - 1) \times 3] \dots\dots\dots 1\text{Mark}$$

$$= \frac{15}{2} [16 + 14 \times 3]$$

$$= \frac{15}{2} [16 + 42]$$

$$= \frac{15}{2} \times 58$$

$$= 435 \dots\dots\dots 1\text{Mark}$$

b) $T_n = ar^{n-1}$ 1Mark

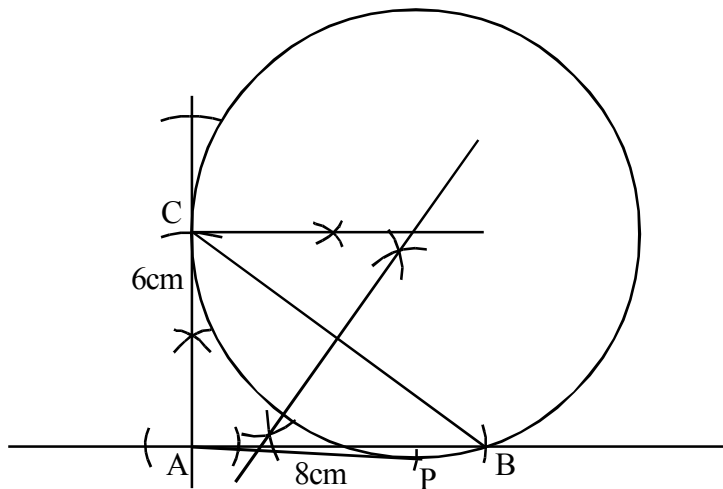
$$T_6 = 3r^{6-1}$$

$$3 \times r^5 = -96 \dots\dots\dots 1\text{Mark}$$

$$r^5 = -32, r^5 = (-2)^5$$

$$r = (-2) \dots\dots\dots 1\text{Mark}$$

08)



- i) Construction of ΔABC 1Mark
 - AB 1Mark
 - $\hat{BAC} = 90^\circ$ 1Marks
 - AC 1Mark
- ii) $BC = 10\text{cm}$ 1Mark
- iii) Construction of circle
 - \perp at C 1Mark
 - Bisection of BC 1Mark
 - Radius = 6.2cm 1Mark
- iv) Construction of tangent 1Mark
- v) $AP = AC$ 1Mark

09)

- i) 12 - 16 1Mark

ii)

Class interval	mid value	frequency (f)	difference (d)	frequency x difference f x d
0 - 4	2	3	-12	-36
4 - 8	6	4	- 8	-32
8 - 12	10	5	- 4	-20
12 - 16	14	8	00	00
16 - 20	18	5	4	20
20 - 24	22	3	8	24
24 - 28	26	2	12	24
		$\Sigma f = 30$		$\Sigma fd = 68 + (-88)$ $= (-20)$

1Mark
1Mark
1Mark
1Mark
mid value column
difference column
frequency difference column
 Σfd

mean = assumed mean + difference mean

$$= 14 + \frac{\Sigma fd}{\Sigma f}$$

$$= 14 + \frac{(-20)}{30}$$

$$= 14 - 0.67$$

$$= 13.33$$

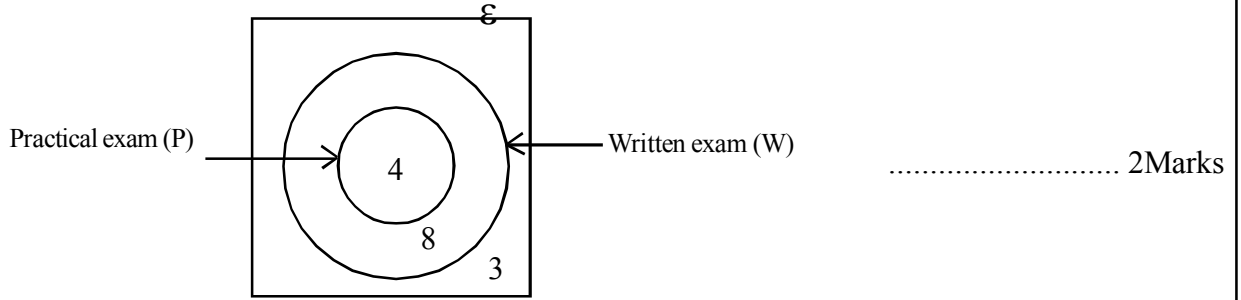
$$\underline{\underline{\Omega}} \quad 13$$

\therefore mean weight if suger = 13 kg 1Mark

1Mark

- iii) $30 \times 13 \times \text{Rs } 90 \dots\dots\dots 1\text{Mark}$
 $= \text{Rs } 35100 \dots\dots\dots 1\text{Mark}$
 iv) $10 \times 13\text{kg} = 130\text{kg} \dots\dots\dots 1\text{Mark}$

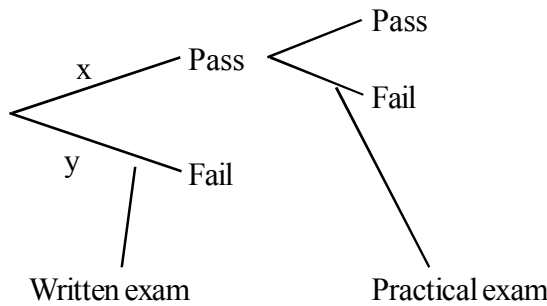
10) i)



ii) $P \subset W \dots\dots\dots 1\text{Mark}$

iii) $\frac{12}{15} \times 100 = 80\% \dots\dots\dots 1\text{Mark}$

b) i)



$x = \frac{12}{15} = \frac{4}{5} \dots\dots\dots 1\text{Mark}$

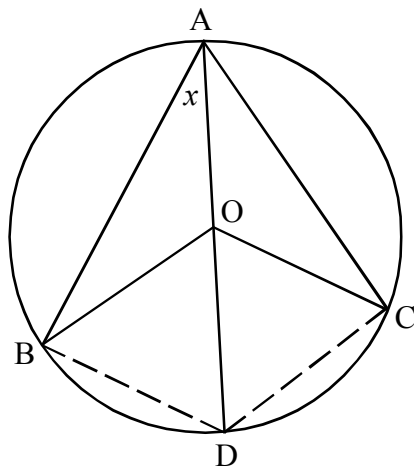
$y = \frac{3}{15} = \frac{1}{5} \dots\dots\dots 1\text{Mark}$

ii) for tree diagram $\dots\dots\dots 2\text{Marks}$

iii) $\frac{12}{15} \times \frac{4}{12}$ Or $\frac{4}{5} \times \frac{1}{3} \dots\dots\dots 1\text{Mark}$

$= \frac{4}{15} \dots\dots\dots 1\text{Mark}$

11)



i) $\Delta AOB, \Delta AOC, \Delta BOD, \Delta COD \dots\dots\dots 2\text{Marks}$

ii) $\Delta ABO, \Delta ACO$
 $AB = AC$ (given) $\dots\dots\dots 1\text{Mark}$
 $OB = OC$ (radii) $\dots\dots\dots 1\text{Mark}$
 $AO = AO$ (common side) $\dots\dots\dots 1\text{Mark}$
 $\Delta ABO \cong \Delta ACO \dots\dots\dots 1\text{Mark}$

iii) $\hat{B}OC = 4x$ 1Mark

iv) $\hat{B}AD$
Theorem 1Mark

v) $\hat{A}BD = 90^\circ$

$\hat{A}CD = 90^\circ$

\therefore in $\triangle ABD, ACD$

$AD = AD$ (common)

$AB = AC$ (given)

$\triangle ABD \cong \triangle ACD$

$\therefore BD = DC$ 2Marks

12) a) Theorem 2 Marks

b) i) $\triangle ABM$

E is the mid point of AB 1Mark

$EO \parallel OM$ (given) 1Mark

$\therefore AO = OM$

ii) in $\triangle AMC$

O is the midpoint of AM (AO = OM) 0.5Mark

F is the midpoint of AC (AF = FC) 0.5Mark

$\therefore OF \parallel MC$ 1Mark

$\therefore MC \parallel BF$

iii) $BO \parallel MC$ [BF \parallel MC] 1Mark

$OC \parallel BM$ [EC \parallel BM] 1Mark

\therefore BMCO is a parallelogram

iv)

$AO = OM = 2x$

but $OD = DM$

$OD = DM = x$

$AD = AO + OD$

$= 2x + x$

$AD = 3x$ 2Marks

$\frac{AD}{AO} = \frac{3x}{2x}$

$2AD = 3AO.$