Immanuel Lutheran College.

S.5 Mock Exam. (2001-2002)

Mathematics. Paper (II).

1. $x = \frac{ab}{1+a+b}$

$x(1+a+b) = ab$

$x + ax + bx = ab$

$x(1+b) = ab - ax$

$x(1+b) = a(b-x)$

$a = \frac{x(1+b)}{b-x}$ (C)

2. $x \xrightarrow{-30\%} 0.7x \xrightarrow{+r\%} x$

$0.7x(1+r\%) = x$

$(1+r\%) = \frac{1}{0.7}$

$1+r\% = 1.4286$

$r\% = 0.4286$

$r\% = 42.86\%$ (D)

3. $y \xrightarrow{+40\%} x \xrightarrow{-20\%} z$

$x = (1+40\%)y$

$= 1.4y$

$z = 1.4y(1-20\%)$

$= 1.12y$

$\therefore y : z$

$= y : 1.12y$

$= 1 : 1.12$

$= 25 : 28$ (D)

4. $\sqrt{x\sqrt{x\sqrt{x}}}$ P.1

$= [x(x(x^{\frac{1}{2}}))^{\frac{1}{2}}]^{\frac{1}{2}}$

$= [x(x^{\frac{3}{2}})^{\frac{1}{2}}]^{\frac{1}{2}}$

$= [x \cdot x^{\frac{3}{4}}]^{\frac{1}{2}}$

$= (x^{\frac{7}{4}})^{\frac{1}{2}} = x^{7/8}$ (B)

5. $\frac{(a^n)^n \cdot a^{n+1}}{a^{-n}}$

$= \frac{a^{n^2} \cdot a^{n+1}}{a^{-n}}$

$= a^{n^2+n+1-(-n)}$

$= a^{n^2+2n+1} = a^{(n+1)^2}$ (A)

6. $(p-1)x^2 - 2x + 1 = 0$ has distinct real roots

$\therefore \Delta > 0$

$(-2)^2 - 4(p-1)(1) > 0$

$4 - 4(p-1) > 0$

$4 - 4p + 4 > 0$

$8 > 4p$

$p < 2$ (C)

7. $3x^2 + 4x + 1 \equiv 3(x+a)^2 + b$

$3x^2 + 4x + 1 = 3(x^2 + 2ax + a^2) + b$

$3x^2 + 4x + 1 = 3x^2 + 6ax + (3a^2 + b)$

$\left\{ \begin{array}{l} \therefore 6a = 4 \\ 3a^2 + b = 1 \end{array} \right.$ $\therefore a = 2/3$, $b = -1/3$ (B)

8. $x^2 + kx - (k+1) = 0$

since 2 is a root.

$\therefore \quad 2^2 + k(2) - (k+1) = 0$

$4 + 2k - k - 1 = 0$

$k = -3$.

$\therefore \quad x^2 - 3x + 2 = 0$

$\therefore \quad \alpha \cdot \beta = \frac{2}{1} = 2 \qquad$ (A)

Method (II).

$x^2 + kx - (k+1) = 0$.

let 2 & α be the roots.

$\therefore \begin{cases} 2 + \alpha = -k. \\ 2\alpha = -(k+1). \end{cases}$

$2\alpha = -k - 1$

$2\alpha = (2+\alpha) - 1$

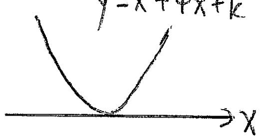
$\alpha = 1$

$\therefore$ product of roots $= 2 \times 1$

$= 2 \qquad$ (A)

9. $y = x^2 + 4x + k$.

touches the x-axis.



For $y = 0$,

$x^2 + 4x + k = 0$.

has repeated roots / double roots.

$\therefore \quad \Delta = 0$

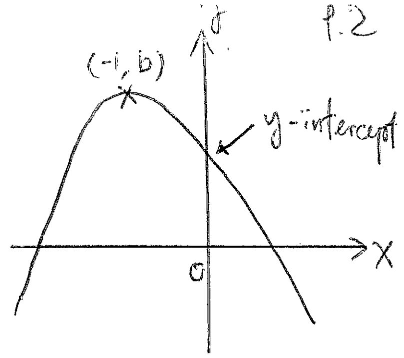
$4^2 - 4(1)(k) = 0$

$16 - 4k = 0$

$4k = 16$

$k = 4 \qquad$ (C)

10. $y = a(x+1)^2 + b$



$\therefore \ a < 0$

(open downwards)

vertex $= (-1, b)$.

$b > 0$.

$\therefore \quad a \cdot b < 0. \quad$ (I) is true.

For $x = 0$,

$y = a(0+1)^2 + b$.

$= a + b$.

$\therefore$ y-intercept $= a + b \neq b$.

$\therefore$ (II) is false.

vertex $= (-1, b) \neq (a, b)$

(III) is false. $\qquad$ (A).

11. $(a^2 + 4a + 4) - (b^2 - 2b + 1)$

$= (a+2)^2 - (b-1)^2$

$= [(a+2) - (b-1)] \cdot [(a+2) + (b-1)]$

$= (a - b + 3)(a + b + 1) \qquad$ ( ).

12. $f(x) = (x^2 - 5x - 6)\, Q(x)$

$= (x-6)(x+1)\, Q(x)$.

$\therefore \quad f(6) = 0$

& $f(-1) = 0$. $\qquad$ (C).

13. $(3x+4y) \propto (4x-5y)$

$\therefore (3x+4y) = k(4x-5y)$

where k is a constant, $\neq 0$.

$3x + 4y = 4kx - 5ky$.

$4kx - 3x = 5ky + 4y$.

$(4k-3)x = (5k+4)y$.

$y = \left(\frac{4k-3}{5k+4}\right) x$.

$\therefore y \propto x$ (B)

since k is a constant,
$\left(\frac{4k-3}{5k+4}\right)$ is also a constant.

14. $\frac{5a+3b}{a+b} = 3$.

$5a+3b = 3a+3b$.

$2a = 0$.

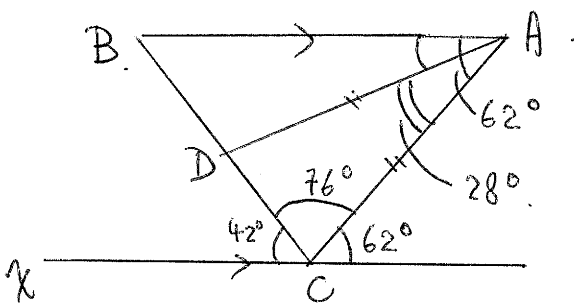
$a = 0$.

$\therefore a+b : a-b$

$= b : -b = 1 : -1$.

(wrong Qu).

15.



step 1: $\angle BAC = 62°$.

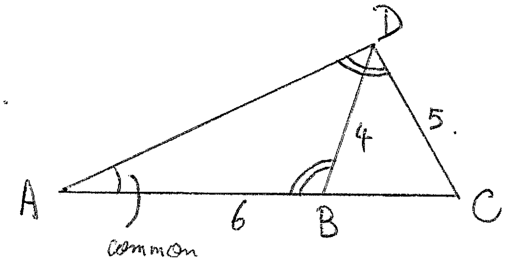
step 2: $\angle ACB = 180° - 62° - 42°$
$= 76°$.

step 3: $\angle ADC = \angle ACB = 76°$.

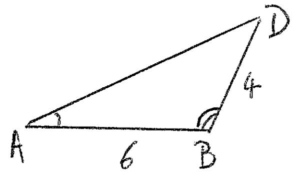
step 4: $\angle DAC = 180° - 76° \times 2$
$= 28°$

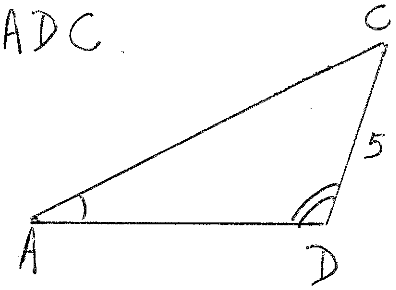
step 5: $\angle BAD = 62° - 28°$
$= 34°$ (D).

16.



$\triangle ABD \sim \triangle ADC$.





$\therefore \frac{AD}{6} = \frac{5}{4}$

$AD = 7.5$. (B).

17. $\left[1 + \cos\left(\frac{\pi}{2} - \theta\right)\right]\left[1 - \sin(\pi - \theta)\right]$

$= [1 + \sin\theta][1 - \sin\theta]$

$= 1 - \sin^2\theta$

$= \cos^2\theta$. (B).

18. $\sin x = 2\cos^2 x - 1$

$\sin x = 2(1-\sin^2 x) - 1$

$\sin x = 2 - 2\sin^2 x - 1$

$2\sin^2 x + \sin x - 1 = 0.$

$(2\sin x - 1)(\sin x + 1) = 0$

$\sin x = \frac{1}{2}$ or $-1.$

$= 30^\circ, 150^\circ, 270^\circ.$ (C).

19. a, b, c, d, e in A.S.

$\begin{cases} b = a + d_1 \\ c = a + 2d_1 \\ d = a + 3d_1 \\ e = a + 4d_1 \end{cases}$ where d_1 is the common difference.

$\therefore b + e = 26.$

$(a+d_1) + (a+4d_1) = 26.$

$2a + 5d_1 = 26$ —— ①

$a + c + d = 29.$

$a + (a+2d_1) + (a+3d_1) = 29.$

$3a + 5d_1 = 29$ —— ②

② − ①

$a = 3.$

$\therefore 2(3) + 5d_1 = 26$

$5d_1 = 20$

$d_1 = 4.$ (C).

20. $1 + x + x^2 + \cdots = \frac{4}{3}$

$a = 1,$
$R = x.$

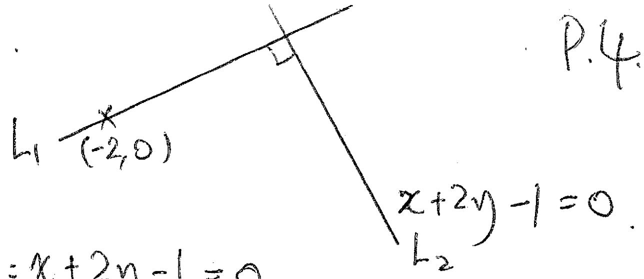
$\frac{a}{1-R} = \frac{4}{3}.$

$\frac{1}{1-x} = \frac{4}{3}$

$3 = 4 - 4x$

$4x = 1, \quad x = \frac{1}{4}$ (D)

21.



$L_2: x + 2y - 1 = 0.$

$2y = -x + 1$

$y = -\frac{1}{2}x + \frac{1}{2}$

$\therefore m_2 = -\frac{1}{2}$

$L_1 \perp L_2$

$\therefore m_1 \cdot m_2 = -1$

$m_1 \cdot (-\frac{1}{2}) = -1$

$m_1 = 2.$

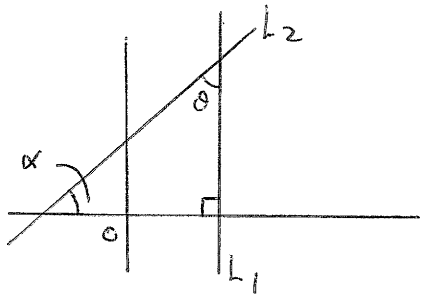
eqt. of L_1

$y - 0 = 2(x - (-2))$

$y = 2x + 4.$

$2x - y + 4 = 0.$ (B).

22.



$L_2 = x - \sqrt{3}y + 4 = 0$

$\sqrt{3}y = x + 4$

$y = \frac{1}{\sqrt{3}}x + \frac{4}{\sqrt{3}}.$

$\therefore m_2 = \frac{1}{\sqrt{3}}$

$\tan\alpha = \frac{1}{\sqrt{3}}.$

$\alpha = 30^\circ$

$\therefore \theta = 60^\circ.$ (C).

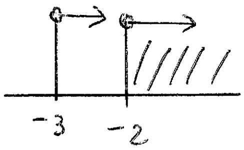
P.5

23. $\begin{cases} -x < 3 \\ \dfrac{2x-4}{4} > -2 \end{cases}$

$\begin{cases} -3 < x \\ 2x-4 > -8 \end{cases}$

$\begin{cases} x > -3 \\ 2x > -4 \end{cases}$

$\begin{cases} x > -3 \\ x > -2 \end{cases}$



$\therefore \quad x > -2$ (A)

24. $(1-2x)(x+1) \geq 1-2x$.

Method (I)

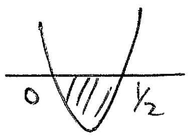
$(1-2x)(x+1)-(1-2x) \geq 0$

$(1-2x)(x+1-1) \geq 0$

$(1-2x)(x) \geq 0$

$-(2x-1)x \geq 0$

$x(2x-1) \leq 0$



$0 \leq x \leq \frac{1}{2}$

Method (II)

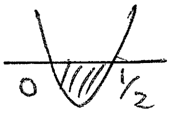
$(1-2x)(x+1) \geq 1-2x$

$x-2x^2+1-2x \geq 1-2x$

$-2x^2+x \geq 0$

$2x^2-x \leq 0$

$x(2x-1) \leq 0$



$0 \leq x \leq \frac{1}{2}$

(B)

25. A, A; B, B; C, C.

P(2 shoes are in pair)

$= P(A \cdot A \text{ or } B \cdot B \text{ or } C \cdot C)$

$= \frac{2}{6} \cdot \frac{1}{5} + \frac{2}{6} \cdot \frac{1}{5} + \frac{2}{6} \cdot \frac{1}{5}$

$= \frac{1}{15} + \frac{1}{15} + \frac{1}{15}$

$= 1/5$. (C)

26. bag A: 3B, 2W; bag B: 3W, 4B'

Method (I)

P(they are different in colour)

$= 1 - P(\text{they are same colour})$

$= 1 - P(W \cdot W)$

$= 1 - \frac{2}{5} \cdot \frac{3}{7}$

$= \frac{29}{35}$. (D)

Method (II).

P(they are different in colour)

$= P(BW \text{ or } BB' \text{ or } WB')$

$= \frac{3}{5} \cdot \frac{3}{7} + \frac{3}{5} \cdot \frac{4}{7} + \frac{2}{5} \cdot \frac{4}{7}$

$= \frac{9+12+8}{35} = 29/35$. (D)

27. $\bar{x} = 2.83$

median $= 3$

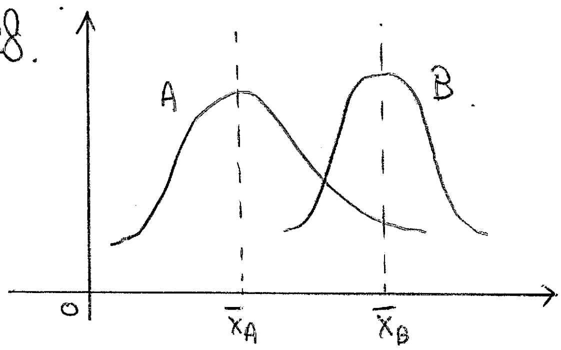
mode $= 2$

(I) median $> \bar{x}$ (false)

(II) mode $>$ median (false)

(III) mode $>$ mean (false) (A)

28.



(I) $\bar{x}_B > \bar{x}_A$ (true)

(II) median of B $>$ median of A (true)

(III) $\sigma_B > \sigma_A$ (false) (B)

29. $\begin{cases} y = \sin x + x & \text{— ①} \\ x + 3y - 2 = 0 & \text{— ②} \end{cases}$

sub ① into ② (remove "y")

$x + 3(\sin x + x) - 2 = 0$

$3\sin x + 4x - 2 = 0$. (C)

30. $\begin{cases} T(3) = 4 \\ T(5) = 20 \end{cases}$

$\begin{cases} aR^2 = 4 & \text{— ①} \\ aR^4 = 20 & \text{— ②} \end{cases}$

$\frac{②}{①}$ $\frac{aR^4}{aR^2} = \frac{20}{4}$

$R^2 = 5$

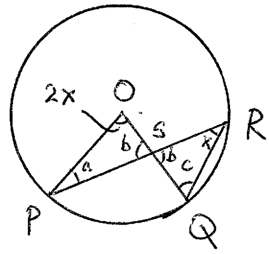
$R = \pm\sqrt{5}$

from ① $aR^2 = 4$

$a(5) = 4$

$a = 4/5$. (B)

31.



let $\angle PRQ = x$.

$\angle POQ = 2x$.

$a + b + 2x = 180°$ — ①

$b + c + x = 180°$ — ②

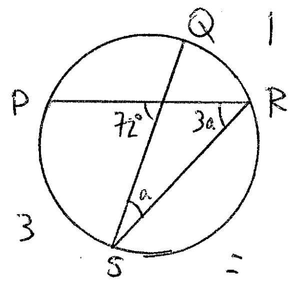
$x = 180° - b - c$.

$\therefore a + b + 2(180° - b - c) = 180°$

$a + b + 360° - 2b - 2c = 180°$

$a = b + 2c - 180°$ (D).

32.



$3a + a = 72°$

(ext. $\angle$s, of $\triangle$)

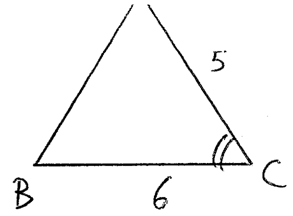
$4a = 72°$

$a = 18°$. (A).

33. $\tan C = \frac{4}{3}$

$\therefore \sin C = \frac{4}{5}$

$\cos C = \frac{3}{5}$



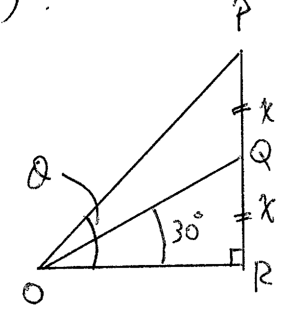
$AB^2 = 5^2 + 6^2 - 2(5)(6) \cdot \cos C$

$AB^2 = 25 + 36 - 60(\frac{3}{5})$

$AB^2 = 25$

$AB = 5$. (D).

34.



Let. $PQ = QR = x$.

$\tan 30^\circ = \frac{x}{OR}$

$\frac{1}{\sqrt{3}} = \frac{x}{OR}$

$OR = \sqrt{3}x$.

$\tan\theta = \frac{2x}{\sqrt{3}x}$

$= \frac{2}{\sqrt{3}}$

$\theta = 49.1^\circ$. (B).

35 perimeter of sector = perimeter of square

$s + 2a = 4a$.

$s = 2a$.

$\therefore \theta = \frac{s}{a} = \frac{2a}{a} = 2$ radian.

$\frac{\text{area of sector}}{\text{area of square}} = \frac{\frac{1}{2}a^2(2)}{a^2}$

$= 1$. (A).

36. vol. of hemisphere = vol. of cone.

$\frac{1}{2} \times \frac{4}{3}\pi r^3 = \frac{1}{3}\pi r^2 h$.

$\frac{2}{3}r = \frac{1}{3}h$.

$2r = h$.

$\frac{r}{h} = \frac{1}{2}$

$\therefore r : h = 1 : 2$. (C).

37. $\log y = n \log x + c$.

$\log y = n \log x + \log 10^c$

$\log y = \log x^n + \log 10^c$

$\log y = \log x^n \cdot 10^c$.

$y = 10^c \cdot x^n$. (A).

38. $\frac{\sqrt{a}}{\sqrt{a} - \sqrt{b}} - \frac{\sqrt{b}}{\sqrt{a} + \sqrt{b}}$.

$= \frac{\sqrt{a}}{\sqrt{a} - \sqrt{b}} \times \frac{\sqrt{a} + \sqrt{b}}{\sqrt{a} + \sqrt{b}} - \frac{\sqrt{b}}{\sqrt{a} + \sqrt{b}} \times \frac{\sqrt{a} - \sqrt{b}}{\sqrt{a} - \sqrt{b}}$.

$= \frac{a + \sqrt{ab}}{a - b} - \frac{\sqrt{ab} - b}{a - b}$.

$= \frac{(a + \sqrt{ab}) - (\sqrt{ab} - b)}{a - b}$

$= \frac{a + b}{a - b}$. (B).

39. $x = \frac{ky^2}{z}$, $k \neq 0$.

$x_1 = \frac{k y_1^2}{z_1}$.

$\begin{cases} y_1 = 1.2y. \\ z_1 = 0.8z \end{cases}$

$x_1 = \frac{k(1.2y)^2}{0.8z}$

$x_1 = \frac{ky^2}{z}(1.8)$

31. (conti)

$x_1 = 1.8x$

% change

$= \frac{x_1 - x}{x} \cdot 100\%$

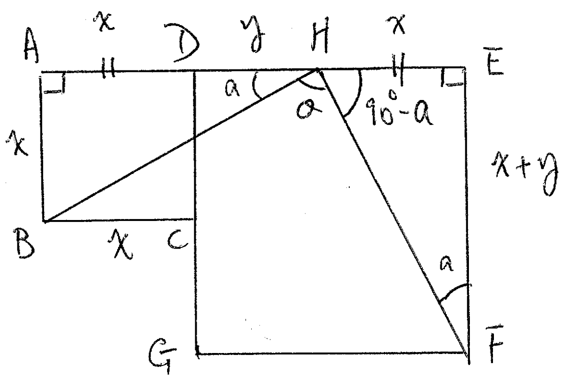
$= \frac{1.8x - x}{x} \cdot 100\%$

$= \frac{0.8x}{x} \cdot 100\%$

$= (0.8)(100\%) = 80\%$

x is increased in 80% (D).

40.



Let AD be x & DH be y.

$\therefore AB = AD = HE = x$.

$\therefore DE = x + y$.

& $EF = DE = x + y$.

$AH = x + y = EF$.

$\therefore$ (II) is true.

But $BC \neq DH$

(I) is false.

since $\triangle ABH \cong \triangle EHF$.

$\therefore \angle AHB = \angle EFH = a$.

$\therefore \angle EHF = 180° - 90° - a$

$= 90° - a$.

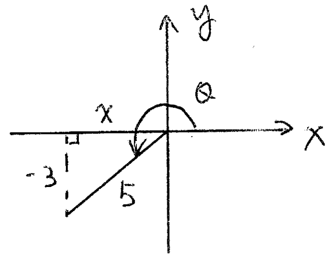
$a + \alpha + (90° - a) = 180°$.

$\alpha + 90° = 180°$

$\alpha = 90°$.

$\therefore$ (III) is true. (D).

41. $\sin\theta = \frac{-3}{5}$.



$x^2 + (-3)^2 = 5^2$

$x^2 = 25 - 9$

$x = \pm 4$.

since $x < 0$, $\therefore x = -4$.

$\cos\theta = \frac{-4}{5}$ & $\tan\theta = \frac{-3}{-4} = 3/4$.

$\therefore \frac{\sin\theta + 3\cos\theta}{\tan\theta}$

$= \frac{-3/5 + 3(-4/5)}{3/4}$

$= \frac{-3}{3/4} = -4$. (C).

42. $\frac{A_2}{A_3} = \left(\frac{l_2}{l_3}\right)^2$

$\frac{1}{3} = \left(\frac{l_2}{l_3}\right)^2$

$\frac{l_2}{l_3} = \frac{1}{\sqrt{3}}$.

$\therefore l_2 : l_3 = 1 : \sqrt{3}$.

$\frac{V_3}{V_1} = \left(\frac{l_3}{l_1}\right)^3$

$\frac{8}{1} = \left(\frac{l_3}{l_1}\right)^3$.

$\frac{l_3}{l_1} = \frac{2}{1}$

$l_3 : l_1 = 2 : 1$

42) $l_2 : l_3 \quad 1 : \sqrt{3}$

$$\frac{l_3 : l_1}{l_2 : l_3 : l_1} = \frac{2 : 1}{2 : 2\sqrt{3} : \sqrt{3}}$$

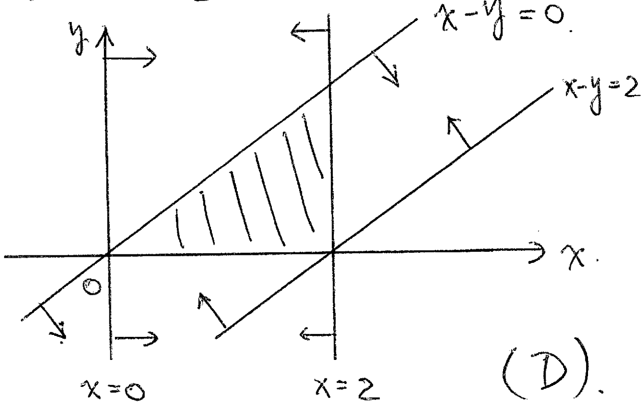
$$\frac{l_2}{l_1} = \frac{2}{\sqrt{3}}$$

$$\frac{A_1}{A_2} = \left(\frac{l_1}{l_2}\right)^2 = \left(\frac{\sqrt{3}}{2}\right)^2 = \frac{3}{4}$$

$\therefore A_1 : A_2 = 3 : 4 \qquad$ (B).

43 $\begin{cases} 0 \le x - y \le 2 \\ 0 \le x \le 2 \end{cases}$

$$\begin{cases} x - y \ge 0 \\ x - y \le 2 \\ x \ge 0 \\ x \le 2 \end{cases}$$



(D).

44.

x	$f(x)$
0.6	+0.26
0.7	+0.06
0.75	−0.02
0.8	−0.10
1	−0.46

$\therefore 0.7 < x < 0.75$

$\therefore x = 0.7$ (cor. to 1 d.p.) (B)

45. $(x+1)^2 - 4(x+1) + 2 = 0 \qquad$ P.9.

Method (I).

α, β are the roots.

$$\therefore \begin{cases} (\alpha+1)^2 - 4(\alpha+1) + 2 = 0 \\ (\beta+1)^2 - 4(\beta+1) + 2 = 0 \end{cases}$$

let $y = \alpha + 1$ & $y = \beta + 1$.

$\therefore y^2 - 4y + 2 = 0$

$\therefore (\alpha+1)$ & $(\beta+1)$ are the roots

(A).

Method (II).

$$(x+1)^2 - 4(x+1) + 2 = 0$$
$$x^2 + 2x + 1 - 4x - 4 + 2 = 0$$
$$x^2 - 2x - 1 = 0$$

$\therefore \alpha + \beta = \frac{-(-2)}{1} = 2$

$\alpha \cdot \beta = \frac{-1}{1} = -1$.

sum of roots $= (\alpha+1) + (\beta+1)$

$= (\alpha+\beta) + 2$

$= 2 + 2 = 4$.

product of roots $= (\alpha+1) \cdot (\beta+1)$

$= \alpha\beta + \alpha + \beta + 1$.

$= -1 + 2 + 1$

$= 2$.

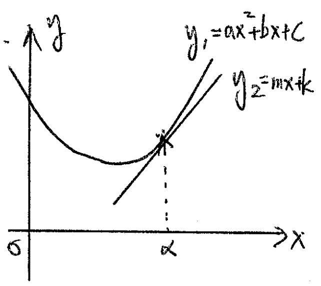
$\therefore$ the required eqt. in y is

$y^2 - 4y + 2 = 0 \qquad$ (A).

46. $ax^2+(b-m)x+(c-k)>0$

$(ax^2+bx+c)-mx-k>0$

$ax^2+bx+c>mx+k$



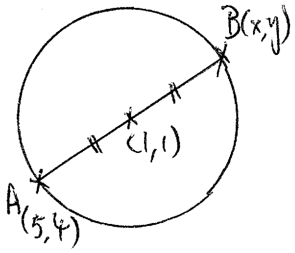
$y_1>y_2$

since ∪ is always greater than / except, $x=\alpha$.

∴ All real values of x except for $x=\alpha$. (D).

47. $x^2+y^2-2x-2y-23=0$.

centre $=(1,1)$.



let B be (x,y)

$$\begin{cases}1=\dfrac{5+x}{2} \ \&\\ 1=\dfrac{4+y}{2}\end{cases}$$

$$\begin{cases}5+x=2\\4+y=2\end{cases} \quad ∴ \begin{cases}x=-3\\y=-2\end{cases}$$

∴ $B=(-3,-2)$. (A).

48. $$\frac{\frac{1}{x^3}-\frac{1}{y^3}}{\frac{1}{x}-\frac{1}{y}}=\frac{\frac{1}{x^3y^3}(y^3-x^3)}{\frac{1}{xy}(y-x)}$$

$$=\frac{1}{x^2y^2}\cdot\frac{(y^3-x^3)}{(y-x)}$$

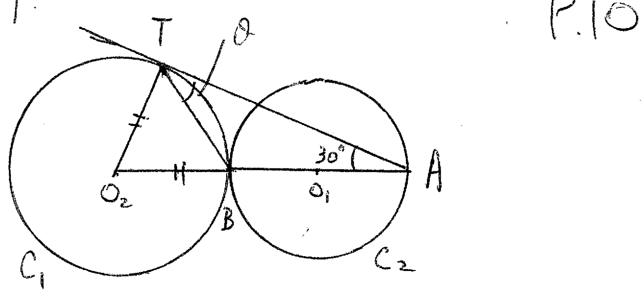
$$=\frac{1}{x^2\cdot y^2}\cdot\frac{(y-x)(y^2+xy+x^2)}{(y-x)}$$

$$=\frac{y^2+xy+x^2}{x^2y^2}$$

(C)

$$=\frac{1}{x^2}+\frac{1}{xy}+\frac{1}{y^2}$$

49.



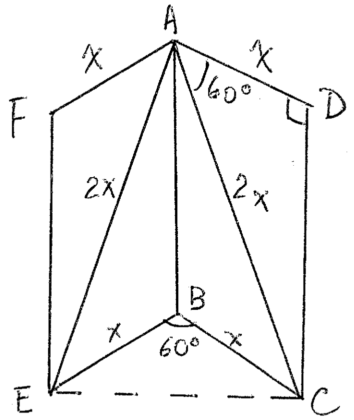
$\angle O_2TA=90^\circ$.

$\angle AO_2T=90^\circ-30^\circ=60^\circ$.

$\angle O_2TB=\angle O_2BT=\dfrac{180^\circ-60^\circ}{2}=60^\circ$.

∴ $\theta=90^\circ-60^\circ=30^\circ$. (B)

50.



let AD be x.

∴ $AD=AF=BC=BE=x$.

$\cos 60^\circ=\dfrac{AD}{AC}$

$\dfrac{1}{2}=\dfrac{x}{AC}$

∴ $AC=2x$. (∵ $AE=AC=2x$)

In $\triangle BCE$,

$CE^2=x^2+x^2-2(x)(x)\cos 60^\circ$

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

$=x^2$

∴ $CE=x$.

In ΔACE.

$$x^2 = (2x)^2 + (2x)^2 - 2(2x)(2x)\cos\angle CAE$$
$$x^2 = 4x^2 + 4x^2 - 8x^2\cos\angle CAE$$
$$8x^2\cos\angle CAE = 7x^2$$
$$\cos\angle CAE = \frac{7}{8}$$
$$\angle CAE = 28.96^\circ \quad (A).$$
$$= 29^\circ \text{ (nearest degree)}$$

51. $4, a, b, 25$ in G.S.

$T(1) = a' = 4$
$T(2) = a = a'R = 4R$
$T(3) = b = a'R^2 = 4R^2$
$T(4) = 25 = a'R^3 = 4R^3$

$\therefore \quad 4R^3 = 25$ —— ①
$4R^2 = b$ —— ②
$4R = a$ —— ③.

$\therefore \log a + \log b$
$= \log a.b$
$= \log(4R)(4R^2)$
$= \log 4.(4R^3)$
$= \log 4(25)$
$= \log 100$
$= 2.$ (C).

52.

$$x^2 + y^2 - 6x - 10y + 9 = 0.$$

For $y = 0$,

$x^2 - 6x + 9 = 0$
$(x-3)^2 = 0$
$x = 3.$
$\therefore P = (3,0).$

For $x = 0$,

$y^2 - 10y + 9 = 0$
$(y-9)(y-1) = 0$
$y = 9$ or 1.

$\therefore Q = (0,1)$ & $R = (0,9)$

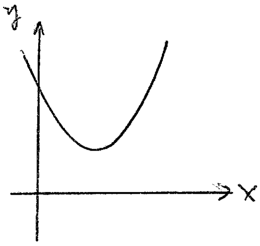
area of ΔPQR
$=$ area of ΔOPR $-$ area of ΔOPQ
$= \frac{1}{2}(3)(9) - \frac{1}{2}(3)(1)$
$= \frac{27}{2} - \frac{3}{2} = 12$ (D).

53.

P(the problem can be solved)
$=$ P(at least one of them solve the problem)
$= 1 - P(J' \cdot P' \cdot N')$
$= 1 - \left(\frac{2}{3}\right)\cdot\left(\frac{3}{4}\right)\cdot\left(\frac{4}{5}\right)$
$= 1 - \frac{2}{5} = 3/5.$ (B).

54. $a^2x^2 - (a+2)x + 1 > 0$.

for all real value of x.



$\therefore \Delta < 0$.

$[-(a+2)]^2 - 4a^2(1) < 0$

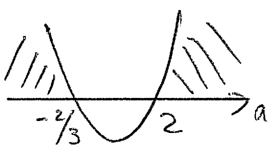
$(a+2)^2 - 4a^2 < 0$

$a^2 + 4a + 4 - 4a^2 < 0$.

$3a^2 - 4a - 4 > 0$.

$(3a+2)(a-2) > 0$

$a < -2/3$ or $a > 2$.



(D)

S.5 Mock Exam. (2001 - 2002).

1. C	6 C	11 D	16 B	21 B	26 D	31 D	36 C
2 D	7 B.	12 C	17 B.	22 C	27 A	32 A.	37 A
3 D	8 A	13 B	18 C	23 A	28 B	33 D	38 B.
4 B	9 C	14	19 C	24 B.	29 C	34 B	39 D
5 A	10 A	15 D	20 D	25 C	30 B	35 A.	40 D.

41 C	46 D	51 C
42 B	47 A	52 D
43 D	48 C	53 B.
44 B	49 B	54. D.
45 A	50 A	