CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC) NORTHERN ZONE
JOINT EXAMINATIONS SYNDICATE (NZ-JES)

FORM TWO PRE-NATIONAL ASSESSMENT

041 BASIC MATHEMATICS

MARKING SCHEME

1.

(a)

2	12	18	36
2	6	9	18
3	3	9	9
3	1	3	3
	1	1	1

G.C.F =2×3=6 ..... 01 mark ..... 01 mark

L.C.M = 2×2×3×3=36 ..... 01 mark

Sum=36+6=42 ..... 02 marks

b) Let $x = 0.56\dot{7}$ ..... (i) $Y = 0.8\dot{3}$

$X = 0.56\dot{7}$ Multiply by 1000 both sides

1000 x x= 0.567x1000

$1000x = 567.567$ .....01 mark

X= $\frac{567}{999} = \frac{63}{111}$ .....01 mark

Y = $0.83^{\cdot}$ Multiply by 10 both sides

10 x y = $0.83^{\cdot}$ x 10 .....01 mark

$$\begin{cases} 10y = 8.33 \\ y = 0.83 \end{cases}$$

$\frac{9y}{9} \quad \frac{7.5}{9} =$

$\frac{75}{6325} \quad \frac{5}{90}$

Y= $\frac{75}{90}$ = 6.....01mark

Then = $\frac{111}{} \times \frac{36}{}$

$= \frac{175}{444}$ .....01 mark

2. a) 7.2tonnes=7.2x1000kg= 7200kg.....02 marks

Mass of sand left=7200kg–230kg=6970kg .....01 mark

=6.97 tonnes ..... 02 marks

b) (i) 2 decimal place=0.05.....2.5 marks

(ii) 3 significant figures=0.0506 .....2.5 marks

3. (a) $x=70^o$[alternate exterior angle] .....2.5 marks

$x+CBD=180$[degree measure of a straight line

$70^o+CBD=180^o$

$CBD=180^o-70^o$

$CBD=110^o$

$CBD+BDC+DCB=180^o$ [Sum of angles in a triangle]

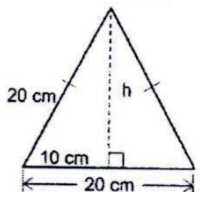
$110^o+y+25^o=180^o$

$135^o+y=180^o$

$y=180^o-135^o$

Y =45^o(2.5MARKS)

b)



(01 mark)

$= \sqrt{20^2-10^2}$,

$=10\sqrt{3}$.....01mark

Area $\frac{1}{2}$bh ..... $\frac{1}{2}$ mark,

=

$= \frac{1}{2} \times 20 \times 10\ \sqrt{3}$.....$\frac{1}{2}$mark,

=100cm$^2\sqrt{3}$ = 173.2cm^2.....02 marks

4. a) Solution

2(3x+2$\mathcal{Y}$=8)

3(2x+3$\mathcal{Y}$=12).....01 mark

6x+4$\mathcal{Y}$=16

6x+9$\mathcal{Y}$=36

0+-5$\mathcal{Y}$=-20

$\frac{-5\mathcal{Y}}{-5} = \frac{-20}{-5}$

$\mathcal{Y}$=4.....1.5 marks

Substute in eqn1 $3x + 2\mathcal{Y} = 8$

3x+ 2 x 4=8.....01 mark

3x +8=8

3x=8−8

$\frac{3x}{33} = \frac{0}{33}$

X=0.....1.5 marks

b) $x^2 - 8x + 7 = 0$

$ac = 7, b = -8$.....01 mark

$factors\ of\ ac\ are -1\ and -7,$

$x^2 - 7x - x + 7 = 0,$.....01 mark

$(x^2 - 7x) - (x + 7) = 0,$

$x\ x-7\ -1\ x-7\ = 0,$.....01 mark

$x-1\ \ x-7\ = 0,$.....01 mark

$Eit\ \ er\ x - 1 = 0\ or\ x - 7 = 0,$

$\therefore\ x = 1\ or\ x = 7$.....01 mark

5. a)Let amount divided be M,

$Sum\ of\ ratios = 2 + 3 + 5 = 10$ .....**01 *mark***

The difference between largest and smallest share is:

$\frac{5}{10} - \frac{2}{10}\ M = 7500,$.....01 mark

$M = 25000$,……01 mark

$Largest\ s\ \ are\ \ = \frac{5}{10}$

$\times 25000 = 12500$

……02 marks

b) ***Given buying price (BP)=720,000 Maintenance=80,000***

Selling price (SP)=980,000BP=720,000+80,000=800,000 ……01 mark

Percentage profit= $\frac{profit\ \ made}{buying\ \ price} \times 100$,……01 mark

$profit\ made = selling\ \ price - buying\ price,$ ……01 mark

$= 980000 - 800000 = 180000$……01 mark

$T\ \ en$ Percentage profit $= \frac{180000}{800000} \times 100 = 25\%$……01 mark

6. (a) Point=(3,5)&(7,9)

Gradient/slope (m) $= \frac{\Delta y}{\Delta x}$, ……..01 mark

$m = \frac{9-5}{7-3} = 1$ ……01 mark

Let P(x, y) *and*(7,9)

m=1

Then1=$\frac{9-y}{7-x}$ …… 01 mark

9-y=1(7-x)

-y=7–x–9

-y=-x–2

y= x+2 ……02 marks

∴

(b) (i) $x', y' = x, y + (a, b)$……01 mark

(1,2)+T=(0,0)

T = (0,0)–(1,2)

T = (-1,-2) ……01 mark

$B'^{(x,y)} = (-1,-2)+T$

= (−1,−2)+(−1,−2)

= (−2,−4) …… 01 mark

(ii) O’ =(0,0)4=(0,0)

A’ =(1,0)4=(4,0)

B’ =(1,1)4=(4,4)

C’ =(0,1)4=(0,4) ……(02 marks @ 0.5)

7. (a) Solution

$= \frac{2+5}{4\ 7+2\ 6} \times \frac{2\ 7-6}{6+2\ 2\ 3\ 5=\ 6\ 0}$……01 mark

$= \frac{}{4\ 7-6}$……01 mark

$$= \frac{4\ 7 - 2\ 6 + 2\ 35 - 30}{22}$$

$$= \frac{28 - 6}{22}$$ ……01 mark

$$= \frac{4\ 7 - 2\ 6 + 2(5 \times 7) - 5 \times 6}{22}$$

$$= \frac{4\ 7 + 2\ 5 \times 7 - 2\ 6 + 5 \times 6}{22}$$ ……..01mark

$$= \frac{2\ 7(2 + 5) - 6(2 + 5)}{22}$$

$$= \frac{(2 + 5)(2\ 7 + 6)}{22}$$ .....01 mark

(b) Solution

$\log_2 8 + \log_3 x = 6,\quad \log_2 2^3 + \log_3 x = 6,$ ……01 mark

$3 + \log_3 x = 6,$ ……01 mark

$\log_3 x = 6 - 3,$ ……..01 mark

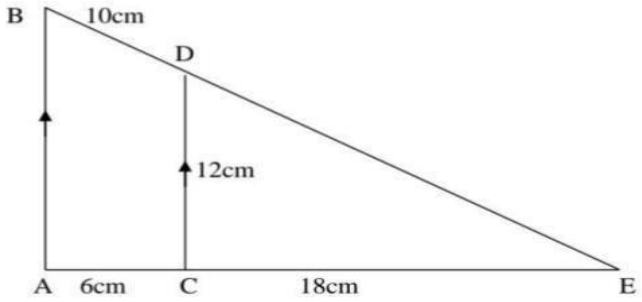
$\log_3 x = 3,\quad 3^3 = x,$ ……01 mark

$\therefore x = 27$……01 mark

8. (a)

Given.

DEC=AEB (common angle)……...1 mark



EDC=EAB(corresponding angle)……....1 mark

BEA=DEC (corresponding angle)

Therefore ΔAEB~ΔDEC (AA-theory) ……1 mark

$$\frac{CE}{AE} = \frac{DE}{BE}$$

$$\frac{18cm}{6cm +} = \frac{DE}{10cm +}$$ (*by crossing multiplication*)

$$\frac{18cm}{DE}$$

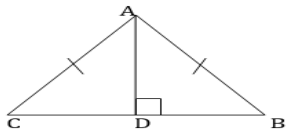
$$24DE = 180 + 18DE$$

$$24DE - 18DE = 180$$

$6CE = 180 \rightarrow DE = 30$……....1 mark

Therefore length DE=30cm……1 mark

(b) Required to prove that triangle ADB≡ triangle ADC



Soln

AB=AC is given (Side, S)……1mark ABD= ACD (Angle, A)……1mark

AD is given (common side,S)……2mark

Then triangle ABD ≡ triangle ACD by SAS theorem……1 mark

9. (a) From the smaller triangle,

$Y^2+8^2 =17^2$

$Y^2+8^2 - 17^2$ …… 01 mark

The RHS is a difference of two squares, $y^2 = (17 – 8) (17 + 8)$

$y^2=9x25$

$y= \sqrt{925}$

$y=3x\ 5$

y=15cm ……*01 mark*

Again, using the larger triangle, $X^2 +9^2 =y^2;x^2 +9^2=15^2$

$X^2= 15^2-9^2$ ……01 mark

The RHS is a difference of two squares, $x^2 = (15 – 9) (15 +9)$ ……01 mark

$x^2=6\ x24\ x^2=144$

$x= \sqrt{144} =12cm$ ……01 mark

x=12cm and y = 15cm

(b) (i)Solution

Sin60° (cos45°+ sin30°)

Sin60° = $\frac{3}{1^2}$ …… $\frac{1}{2}$ ***mark***

Sin30°=$\frac{1}{2}$……$\frac{1}{2}$ ***mark***

Cos45° = $\frac{2}{2}$ ……..$\frac{2}{2}$ ***mark***

$\frac{3}{2} + \frac{1}{2} = \frac{3}{2}(1 + \frac{2}{2})$……..01 mark

(ii)soln $\frac{2}{2}$ $\frac{2}{4}$

$tan45° = 1$……$\frac{1}{2}$ ***mark***

$cos60°$ $\frac{1}{2}$ ..... $\frac{1}{2}$ ***mark***

$tan30° = \frac{\frac{2}{3}}{\frac{3}{3}}$ ..... $\frac{1}{2}$ ***mark***

$\frac{1}{3} - \frac{1}{3}$

$\frac{1(4x_2 - \frac{3}{3})}{\frac{6-3}{3}}$ **01*mark***

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

10. a) Let n(H) = number of those who takes history n(C)=number of those who take commerce

Given n(H∪C)= 37

But we know:

n(H∪C)=n(C)+n(H)–n(H∩C) 37 = 27 + 25 – n(H∩C)

n(H∩C)=15**.....01 mark**

i. Those who take history and commerce are 15.....01 mark

ii. Those who takes history only=25– 15= 10 students.....01 mark

iii. Number of those who take neither history nor commerce

=45- n(H∪C)***=45–37 = 8***.....*01 mark*

10.(b). cumulative distribution table.....03 marks

Mass(kg)	Frequency	upper limit	cumulative frequency,
40 -44	7	44.5	7
45 -49	8	49.5	15
50 -54	11	54.5	26
55 -59	10	59.5	36
60-64	4	64.5	40
65-69	2	69.5	42

Cumulative frequency curve (03 marks)