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Buddhanagar, Kathmandu

2nd TERMINAL EXAMINATION - 2077

Name of the student: Anuj Sapkota Class: 8

Section: Gallica Roll No: 6 Subject: Mathematics Date: 5/9/2077

Symbol No.: Symbol No. In words:

To be filled by Examiner:

Obtained Marks: Marks in words:

Date: Examiner:

Start from here:

Group 'A' [6×1=6]

1. → Soln,

Here,

$U = \{1, 2, 3, 4, 6, 8, 12, 24\}$

$B = \{1, 2, 3, 4, 6, 12\}$

We know,

(i) $\overline{\overline{B}} = U - \overline{B}$

Now,

(ii) $\overline{B} = U - B = \{1, 2, 3, 4, 6, 8, 12, 24\} - \{1, 2, 3, 4, 6, 12\}$

$= \{8, 24\}$

Continuing (i),

(i) $\overline{\overline{B}} = U - \{8, 24\}$

$= \{1, 2, 3, 4, 6, 8, 12, 24\} - \{8, 24\}$

$\therefore \overline{\overline{B}} = \{1, 2, 3, 4, 6, 12\}$

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2. → Soln,

Here,

CP = Rs. 1250

SP = Rs. 1000

We know,

Actual loss = CP − SP

= Rs. (1250 − 1000)

= Rs. 250

Now,

$$\text{Loss \%} = \frac{\text{Loss}}{CP} \times 100\% = \frac{250}{1250} \times 100\% = 20\%$$

∴ Actual loss is Rs. 250 and Loss% is 20%.

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3. → Soln, Here,

P = Rs. 1400

I = Rs. 560

R = 10% p.a.

T = ?

We know,

$$T = \frac{I \times 100}{P \times R} = \frac{560 \times 100}{1400 \times 10} = 4 \text{ years}$$

∴ T = 4 years.

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4. → Soln,

Here,

$= 2x(x+y-z) - y(x+y-z) + 3z(x+y-z)$

$= 2x\ (x+y-z)(2x-y+3z)$

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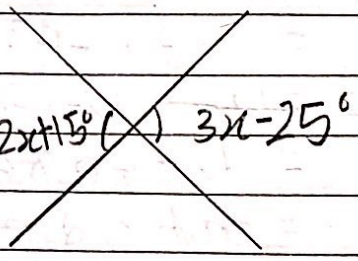
5) → Soln,

Here,

$2x+15° = 3x-25°$ [∵ Vertically opposite angles]



or, $15°+25° = 3x-2x$

∴ or, $x° = 40°$

Now,

∵ $2x+15° = 2\times40+15 = 80+15 = 95°$

∵ $3x-25° = 3\times40-25 = 120-25 = 95°$

6° → Soln,

Here,

~~$y°+60°+60° = 180$~~

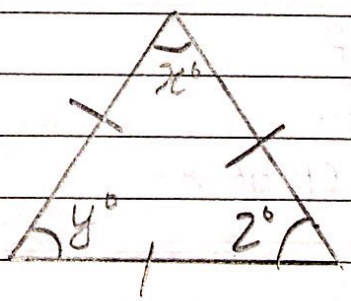
$y° + x° + z° = 180°$ [∵ Sum of the angles of a triangle]

or, $y°+y°+y° = 180°$ [∵ Equilateral ∆ triangle]

or, $3y° = 180°$

or, $y° = \frac{180°}{3}\ 60°$

∴ $y° = 60°$



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Group 'B'

1) → Soln,

Here,

$U = \{a, b, c, d, e, f\}$, $A = \{a, b, c, d\}$ ~~verify it.~~

Now,

$\bar{\bar{A}} = U - \bar{A}$

$= U - \{U - A\}$

$= U - (\{a, b, c, d, e, f\} - \{a, b, c, d\})$

$= U - \{e, f\}$

$= \{a, b, c, d, e, f\} - \{e, f\}$

$\therefore \bar{\bar{A}} = \{a, b, c, d\}$

Since,

$\bar{\bar{A}} = A = \{a, b, c, d\}$

$\therefore \bar{\bar{A}} = A$

Verified

2. Soln,

Here,

SP = Rs. 690

P% = 15%

CP = ?

~~We know,~~ Now,

Let CP be x.

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$CP = SP - P$

or, $x = Rs.690 - 15\%\ of\ x$

or, $x = Rs.690 - \frac{15}{100} \times x$

or, $\frac{x}{1} + \frac{115x}{100} = Rs.690$

or, $\frac{100x + 15x}{100} = Rs.690$

or, $\frac{115x}{100} = Rs.690$

or, $x = \frac{Rs.690 \times 100}{115}$

$\therefore x = Rs.600$

∴ The CP of the article = Rs.600.

---

3 → Soln

Here,

$P = Rs.3260$

$R = 6\%\ p.a$

$T = 2y\ 6m = \frac{30}{12} = \frac{5}{2} = 2.5y.$

$I = ?$

We know,

$I = \frac{PTR}{100}$

$= \frac{Rs.3260 \times 6 \times 2.5}{100} = \frac{Rs.48900}{100} = Rs.489.$

12
+12
24
+6
30

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∴ The interest is Rs. 489.

4. $= 16p^4 - q^4r^4$

$= (4p^2)^2 - (q^2r^2)^2$

$= (4p^2+q^2r^2)(4p^2-q^2r^2)$

$= (4p^2+q^2r^2)\{(2p)^2-(qr)^2\}$

$= (4p^2+q^2r^2)(2p+qr)(2p-qr)$

$= (2p+qr)(2p-qr)(4p^2+q^2r^2)$

5) → Soln

Here,

1st term $= 6a^4b^2 = 2\times3\times a\times a\times a\times a\times b\times b$

2nd term $= 9a^2b^3 = 3\times3\times a\times a\times b\times b\times b$

3rd term $= -12a^3b^4 = 3\times2\times2\times a\times a\times a\times b\times b\times b\times b$

∴ HCF $= 3a^2b^2$

6) → Soln,

Here,

1st term $= a^3 - 4a = a(a^2-4a)$ 2+5

$= a\{a^2-(2a)^2\}$

$= a(a+2a)(a-2a)$

2nd term $= a^2+7a+10$

$= a^2+(2+5)a+10$

$= a^2+2a+5a+10$

$= a(a+2)+5(a+2)$

$= (a+2)(a+5)$

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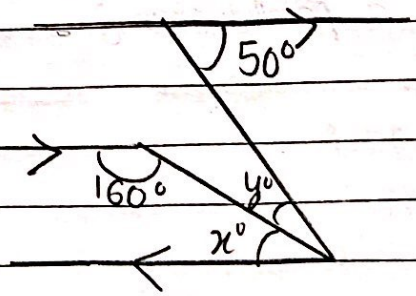
∴ LCM = $a(a+2)(a-2)(a+5)$

7) → Soln,

Here,



→ Soln,

Here,

(i) $x° + 160° = 180°$ [∵ co-interior angle]

or, $x° = 180° - 160°$

∴ $x° = 20°$

We know,

(ii) $x° + y° = 50°$ [∵ alternate angle]

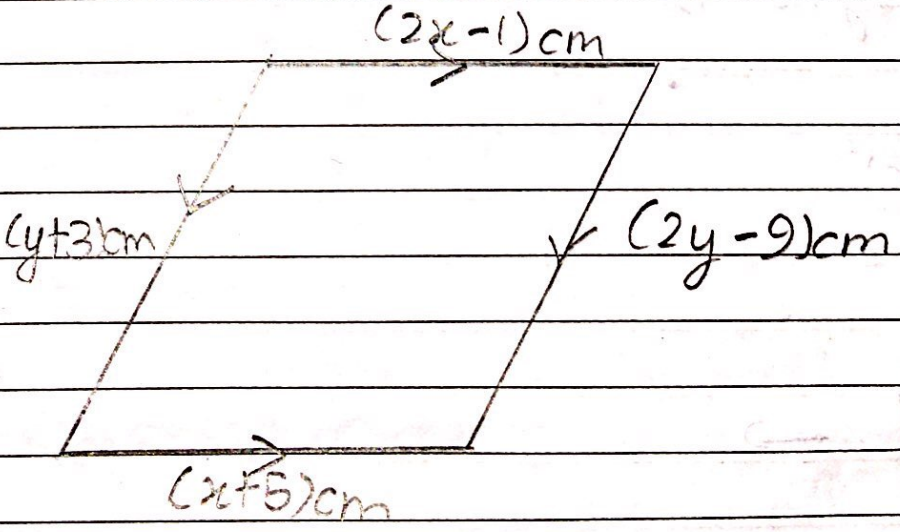
or, $20° + y° = 50°$

or, $y° = 50° - 20°$

∴ $y° = 30°$

8) → Soln,

Here,



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→ Soln,

Here,

(i) $(x+5)$ cm $= (2x-1)$ cm [∵ Opposite sides of a parallelogram]

or, $x+5 = 2x-1$

or, $2x-x = 5+1$

or, $x = 6$

∴ $x = 6$cm

So,

∴ $2x-1 = 2\times6-1 = 12-1 = 11$cm

∴ $x+5 = 6+5 = 11$cm

(ii) $(2y-9)$cm $= (y+3)$cm [∵ opposite side of parallelogram]

or, $2y-9 = y+3$

or, $2y-y = 9+3$

∴ $y = 12$cm

So,

∴ $2y-9 = 2\times12-9 = 15$cm

∴ $y+3 = 12+3 = 15$cm

Group 'C'

1) → Soln,

Here,

→

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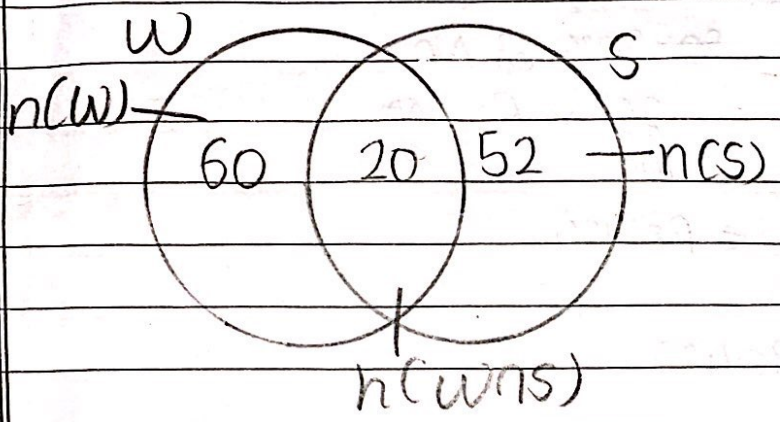
Let W and S be students who like winter and summer vacation respectively.

$n(W) = 60$

$n(S) = 52$

$n(W \cap S) = 20$

(i)



(ii) $n(W \cup S) = n(W) + n(S) - n(W \cap S)$

$= 60 + 52 - 20$

$= 112 - 20$

$= 92$

∴ The no. of students who like winter or summer vacation is 92.

(iii) $n_0(W) = n(W) - n(W \cap S)$

$= 60 - 20$

$= 40$

∴ 40 students like winter vacation only.

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2. → Soln, Here,

(i) CP = Rs. 1680

(ii) MP = (100+25)% of Rs. 1680

$= \frac{125}{100} \times$ Rs. 1680

= Rs. 2100

(iii) Rate of discount = 20%.

(iv) Discount amount = 20% of MP

$= \frac{20}{100} \times$ Rs. 2100

= Rs. 420

(v) SP = MP − d

= Rs. 2100 − Rs. 420

= Rs. 1680

(vi) VAT = 13%.

(vii) VAT amount = 13% of SP $= \frac{13}{100} \times 1680$ = Rs. 218.40

Now,

(viii) SP with vat = SP + VAT amount

= Rs. 1680 + Rs. 218.40

= Rs. 1898.40

∴ The customer has to pay Rs. 1898.40 for the calculator.

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3) a) $= 4x^2 - 17xy - 15y^2$
$= 4x^2 - (20-3)xy - 15y^2$
$= 4x^2 - 20xy + 3xy - 15y^2$
$= 4x(x-5y) + 3y(x-5y)$
$= (x-5y)(4x+3y)$

b) $= (x+2y)^2 - (2x-y)^2$
$= (x+2y+2x-y)(x+2y-2x+y)$
$= (3x+y)(3y-x)$

4. → Soln,
Here,
1st term $= 4x^2 - 9y^2$
$= (2x)^2 - (3y)^2$
$= (2x+3y)(2x-3y)$
2nd term $= 2x^2 + 3xy = x(2x+3y)$
3rd term $= 2x^2 + 5xy + 3y^2 =$
$= 2x^2 + (2+3)xy + 3y^2$
$= 2x^2 + 2xy + 3xy + 3y^2$
$= 2x(x+y) + 3y(x+y)$
$= (x+y)(2x+3y)$

$\therefore$ HCF $= (2x+3y)$

3x2
6
1 | 6
2 | 3

→

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5) → Soln, Here,

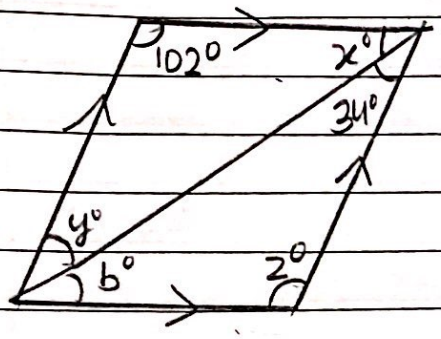
1st term = $a^2-b^2 = (a+b)(a-b)$

2nd term = $(a-b)^2 = (a-b)(a-b)$

3rd term = $a^2b - ab^2 = ab(a-b)$

∴ LCM = ~~$(a+b)(a-b)^2$~~ = $ab(a+b)(a-b)^2$

6) → Soln, Here,



∴ $z° = 102°$ [∵ opposite angles of a parallelogram]

∴ $y° = 34°$ [∵ alternate angle]

$x° + 34° + 102° = 180°$ [∵ co-interior angle]

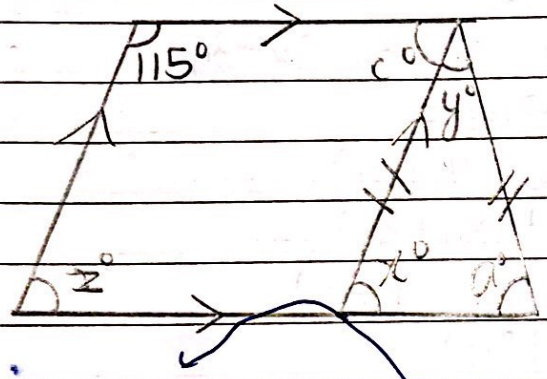
or, $x° + 136° = 180°$

or, $x° = 180° - 136°$

∴ $x° = 44°$

∴ $b° = x° = 44°$ [∵ alternate angle]

7)



→ Soln, Here,

$c° + 115° = 180°$ [∵ co-interior angle]

or, $c° = 180° - 115°$

∴ $c° = 65°$

∴ $z° = c° = 65°$ [∵ Opposite angles of parallelogram]

∴ $x° = c° = 65°$ [∵ alternate angle]

∴ $a° = x° = 65°$ [∵ base angles of a isoceles triangle]

$x° + y° + a° = 180°$ [∵ sum of the angles of a triangle]

or, $65° + 65° + y° = 180°$

or, $y° = 180° - 130°$ ∴ $y° = 50°$