8th Grade

correction-standards of Mid-Term

Feb-2014

Ex1

1) $A = \dfrac{\frac{11}{4}+\frac{1}{5}}{\frac{1}{4}+\frac{7}{5}} = \dfrac{\frac{55+4}{20}}{\frac{5+28}{20}} = \dfrac{59}{33}$ ($\frac{1}{4}$) ($\frac{1}{4}$) ($\frac{1}{4}$)

$B = (\frac{1}{2}) \ldots = \dfrac{59}{35}$ ($\frac{1}{4}$)

($B < A$) $\dfrac{59}{35} < \dfrac{59}{33}$ ($35 > 33$) ($\frac{1}{4}$) True ($\frac{1}{4}$)

2) $E = \dfrac{125^3 + 75^2}{125 \times 15^2} = \dfrac{5^9 + 5^4 \times 3^2}{5^5 \times 3^2} = \dfrac{5^4(5^5 + 3^2)}{(5^5 \times 3^2)} = \dfrac{5^5 + 3^2}{3^2}$ ($\frac{1}{2}$) ($\frac{1}{2}$) T ($\frac{1}{4}$)

is not a decimal number since the deno isn't a power of 2 or of 5 or of 10 ($\frac{1}{2}$)

3) Fig. ($\frac{1}{4}$)

($\frac{1}{4}$) True

$\widehat{AMB} = 90°$ (- -) ($\frac{1}{4}$), then $MI = \frac{AB}{2} = IA = IB$ (In a right Δ, Median $= \frac{hyp}{2}$ ...)

[IM] is median relative to [AB] ($\frac{1}{4}$)

($\frac{1}{4}$)

4) True, since in an equi Δ the heights & the medians drawn from any vertex are the same ($\frac{1}{2}$) then the point of intersection of heights (orthocenter) & that of medians (centroid) coincide each other ($\frac{1}{4}$)

5) $A = \left(\frac{5}{3}\right)^x \left(\frac{3}{5}\right)^{x+1}$

$= \dfrac{5^x \, 3^{x+1}}{3^x \times 5^{x+1}} = \dfrac{3}{5} = \dfrac{6}{10} = 6 \times 10^{-1}$ ($\frac{1}{4}$) ($\frac{1}{4}$) ($\frac{1}{4}$) ($\frac{1}{4}$) T

or $= \frac{3}{5} = 0.6 = 6 \times 10^{-1}$

6) Area AMCD = Area ABCD — Area ΔBMC ($\frac{1}{4}$)

$= AB \times BC - \dfrac{MB \times BC}{2}$ ($\frac{1}{2}$)

($\frac{1}{4}$) AB = DC = 4 (--) opposite sides are ---

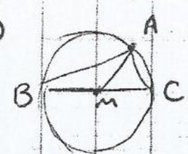
($\frac{1}{4}$) MB = 4 − x collinear pts

$= 4 \times 3 - \dfrac{(4-x)(3)}{2}$ ($\frac{1}{4}$)

$= 12 - \dfrac{12 - 3x}{2}$ ($\frac{1}{4}$)

$= \dfrac{12 + 3x}{2}$ cm² $\neq$ 12 − 3x cm² ($\frac{1}{4}$) ($\frac{1}{4}$) F → ($\frac{1}{4}$)

7)



$MA = MB = MC$ (Radii in the same ...) $\frac{1}{4}$

Then $MA = \frac{BC}{2}$ where M is the midpt of $[BC]$

thus ABC is right at A (If in a Δ, the median relative to the opp. side is equal to its half, $\frac{1}{2}$ then the triangle is right) 1 $\frac{1}{4}$

Ex. 2

Part A

1) $g(x) = x^2 - 9 + 2x^2 - 6x + 4x - 12 - (x^2 - 6x + 9)$ $\frac{1}{2}$ $\frac{1}{4}$

$-x^2 + 6x - 9$ $\frac{1}{4}$

$= 2x^2 + 4x - 30$ $\frac{1}{2}$

$\rightarrow \deg g(x) = 2$ $\frac{1}{2}$

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

$2x^2 + 4x - 30 = 2x^2 + 2$ $\frac{1}{4}$

$2x^2 + 4x - 30 - 2x^2 - 2 = 0$ $\frac{1}{4}$

$4x - 32 = 0$, $x = 8$ $\frac{1}{2}$

3) $f(x) \stackrel{?}{=} (x-3)(x-2)$

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

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

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

Or: $f(x) = x(x-3) - 2(x-3)$ $\frac{1}{2}$

$= (x-3)(x-2)$. $\frac{1}{2}$

4) a) $g(x) = \ldots$

$= (x-3)(x+3) + 2(x-3)(x+2) - (x-3)^2$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

$= (x-3)[x+3 + 2x+4 - (x+3)]$ $\frac{1}{4}$ $\frac{1}{4}$

$-x+3$

$= (x-3)(2x+10)$

$= 2(x+5)(x-3)$ $\frac{1}{4}$

b) The root of a polyn. is the value of the variable that when it's replaced by it, gives a zero polynomial. $\frac{1}{2}$

$\rightarrow$ $g(x) = 0$ $\frac{1}{4}$

$2(x+5)(x-3) = 0$ $\frac{1}{4}$ or $g(-5) = \dots = 0$

$g(3) = \dots = 0$

$\frac{1}{4}$ $x+5=0$ or $x-3=0$

$\frac{1}{4}$ $x=-5$ or $x=3$

The roots are -5 & 3.

B

$$R(x) = \frac{2f(x)}{g(x)}$$

1) $R(x)$ ~~is~~ represents a fractional expression, since it's a fraction containing polynomials in x in the numerator & the denom. 1

$\frac{1}{2}$ $1 \longrightarrow R(1) = \frac{2f(1)}{g(1)} = \dots = \frac{2(+2)}{2(-12)} = \frac{-1}{6}$

$\frac{1}{4}$ $0 \longrightarrow R(0) = \frac{2f(0)}{g(0)} = \dots = \frac{2\times6}{-30} = \frac{-2}{5}$ $\frac{1}{4}$

$\frac{1}{4}$ $3 \longrightarrow R(3) = \frac{2f(3)}{g(3)} = \frac{0}{\dots} = \frac{0}{0}$ (undet. value)

$\frac{1}{4}$ $-5 \longrightarrow R(-5) = \frac{2f(-5)}{g(-5)} = \frac{2\times56}{0}$ (imposs.) $\frac{1}{4}$

$\frac{1}{4}$ 1 & 0 are included in the domain of R since

$R(1)$ & $R(0)$ are possible values (exist)

$\frac{1}{4}$ 3 & -5 are excluded from the domain since $R(3)$ & $R(-5)$ are imposs. values (don't exist)

b) The domain of def. of $R(x)$ is the set of all real values except 3 & -5. 1

c) $R(x)$ is def. for all integers except 3 & -5 1.

(½) 3) a) $h(x) = \frac{2f(x)}{g(x)} = \frac{\cancel{2}\cancel{(x-3)}(x-2)}{\cancel{2}(x+5)\cancel{(x-3)}} = \frac{x-2}{x+5}$ (½)

b) $h(x) = 3$

$\frac{x-2}{x+5} = \frac{3}{1}$, $x - 2 = 3x + 15$ (¼)

$-2 - 15 = 3x - x$

$-17 = 2x$ (½)

$x = \frac{-17}{2}$ (acc. ¼)

Ex 3 1) • $AB = \frac{1}{5} + \frac{8^2 \times 40^{-1}}{2 \times 6^{-1}}$

$= \frac{1}{5} + \frac{8^2 \times 6}{2 \times 40} = \frac{1}{5} + \frac{\overset{24}{\overbrace{8 \times 3}}}{5} = \frac{25}{5} = 5$ km (½) (¼)

• $AC = \frac{1}{5} + \frac{2^{42} + 5 \times 8^{14}}{10 \times 2^{39}}$

$= \frac{1}{5} + \frac{2^{42} + 5 \times 2^{42}}{2^{40} \times 5} = \frac{1}{5} + \frac{2^{42}(1+5)}{2^{40} \times 5} = \frac{1}{5} + \frac{\overset{24}{\overbrace{4 \times 6}}}{5} = \frac{25}{5} = 5$ km (½) (½) (¼) (¼)

Then ABC is isos at A having 2 equal sides. (¼)

2) Figure: (1½)

3) Nature of BCFE:

(¼) • (BC) // (EF) (given)

• (CF) ⊥ (xy) & (BE) ⊥ (xy) (given)

Then (CF) // (BE) (2 st. lines ⊥ to same st. line are //) (½)

Then BCFE is a parall. (¼) (opp. sides are //)

(½) But $\widehat{CFE} = 90°$ (def. of ⊥)

Thus BCFE is a rectangle (parall. with 1 right angle)

b) R.T.P : CAF & EBA are cong. tr.

Proof (1/4)

AFC & ABE are right triangles at F & E resp. (def. of ⊥)

(1/4) (H) • CA = AB = Hyp (2 sides in an isos. tr. =)

(1/4) (S) • FC = BE (opp. sides in a rect. are =)

Thus both Δ are cong. by HS (1/4) . Rule (1/2) ...

c) AE = AF (1/2) (homolog. elements ...)

but A, E, & F (1/4) are collinear

Thus A is the midpt of [EF] (1/4)

4) (1/4) (AB) // (CJ) (given)

a) (1/4) (AJ) // (BC) since (EF) // (BC) & J, E, A, & F are collinear

Thus AJCB is a parall. (1/2) (opp. sides are //)

b) (AC) // (BK) (given) (1/4)

(AB) // (CK) (") (1/4) (1/4)

Thus ABKC is a parall. (opp. sides are //)

But AB = AC (proved) (1/4)

Thus ABKC is a rhombus (1/2) (parallelogram having 2 adjacent equal sides) ,

c) (AK) ⊥ (BC) (1) (Diag. in a rhombus are ⊥ to each other)

5) (1/2) R midpt of [AC] (diag. in a parall bisect each other)

N " " [AB] (" " ")

Then [BR] & [CN] are the (1/4) 2 medians relative to [AC] & [AB] resp.

& they intersect in G. (1/4) thus G is the centroid (1/2) of Δ ABC

$\frac{1}{4}$

5) b) $\begin{cases} AEB \text{ is right } \Delta \text{ at } E \\ N \text{ midpt of } [AB] \text{ (proved)} \end{cases}$ (given $(BE) \perp (EA)$)

$\frac{1}{2}$

Then $EN = \frac{AB}{2}$ (In a right Δ, - - -)

$\frac{1}{4}$

thus $EN = \frac{5}{2} = 2.5$ cm

c) $\frac{1}{4}$ $FR = \frac{AC}{2}$ (- - -)

$AB = AC$ (proved)

$\frac{1}{4}$ then $FR = \frac{AB}{2}$ (by comparison)

$\frac{1}{4}$ & $EN = \frac{AB}{2}$ (proved)

thus $FR = EN$ (by subst.)

$\frac{1}{4}$