AL ADWAA

Gem

Mathematics

نماذج اجابات

الصف الثالث الإعدادى

الفصل الدراسى الثانى

2021

Model Answer 1

Algebra

1 **Choose the correct answer:**

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

(2) P (A) + P (B)

(3) $\{0 , 1\}$

(4) (2 , 1)

(5) $\mathbb{R}$

(6) $\mathbb{R}$

2 **(a)** $n(x) = \frac{x}{x-2} \div \frac{x+3}{(x-2)(x+1)}$ factorize

Domain of $n = \mathbb{R} - \{2 , -1 , -3\}$

$n(x) = \frac{x}{x-2} \times \frac{(x-2)(x+1)}{x+3}$ switch to multiplication

$n(x) = \frac{x(x+1)}{x+3}$ simplify

(b) $y = (1 - 2x)$ (1)

$x + 2y = 5$ (2)

By substituting (1) in (2)

$x + 2(1 - 2x) = 5$

$x + 2 - 4x = 5$

$-3x = 3$

$x = -1$

Substitute in (1)

$y = (1 - 2(-1))$

$y = 3$

S.S. = $\{(-1 , 3)\}$

3 **(a)** P(A – B) = P(A) – P(A ∩ B)

P(A – B) = 0.7 – 0.3 = 0.4

(b) $n(x) = \frac{x(x+1)}{(x-1)(x+1)} - \frac{x+5}{(x+5)(x-1)}$ factorize

Domain of n = $\mathbb{R} - \{1 , -1 , -5\}$

$n(x) = \frac{x}{(x-1)} - \frac{1}{(x-1)}$ simplify

$n(x) = \frac{x-1}{(x-1)}$ subtract

$n(x) = 1$ simplify

4 **(a)** a = 1 , b = –4 , c = 1

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

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

$$x = \frac{4 \pm \sqrt{12}}{2} = 2 \pm \sqrt{3}$$

$x = 2 + \sqrt{3} \simeq 3.73$, $x = 2 - \sqrt{3} \simeq 0.27$

S.S.= { 3.73 , 0.27 }

(b): $\because n_1(x) = \frac{2x}{2x+6} = \frac{2x}{2(x+3)} = \frac{x}{x+3}$

$\because$ The domain $n_1 = \mathbb{R} - \{-3\}$

$\because n_2(x) = \frac{x^2+3x}{x^2+6x+9} = \frac{x(x+3)}{(x+3)(x+3)} = \frac{x}{x+3}$

$\because$ The domain $n_2 = \mathbb{R} - \{-3\}$

$\because n_1(x) = n_2(x)$, domain of n_1 = domain of n_2

$\therefore n_1 = n_2$

5 **(a)** (1) $n(x) = \frac{x-2}{x+1}$

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

the domain of $n^{-1} = \mathbb{R} - \{-1 , 2\}$

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

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

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

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

$2x - 4 = x + 1$

$2x - x = 1 + 4$

$\therefore x = 5$

(b) $x - y = 1$ (1)

$x^2 - y^2 = 25$

$(x - y)(x + y) = 25$ (2)

Substitute (1) in (2)

$(x + y) = 25$ (3)

By adding (1) and (3)

Substitute (1) in (2)

$2x = 26$

$x = 13$

Substitute in (1)

$13 - y = 1$

$y = 12$ S.S = {(13, 12)}

Model Answer 2

1 Choose the correct answer:

(1) $\{0,1,-1\}$ (2) $\{-3, 3\}$ (3) $\mathbb{R} - \{2, -5\}$

(4) $\mathbb{R} - \{0,1,-1\}$ (5) $\{(3, 3), (-3, -3)\}$ (6) $\{-5, 5\}$

2

(a) (1) $P(A \cap B) = \frac{2}{6} = \frac{1}{3}$

(2) $P(A - B) = \frac{1}{6}$

(3) $P(A`) = \frac{3}{6} = \frac{1}{2}$

(b) $n(x) = \frac{x-3}{(x-3)(x-4)} - \frac{4}{x(x-4)}$ factorize

Domain n $= \mathbb{R} - \{3, 4, 0\}$

$n(x) = \frac{1}{(x-4)} - \frac{4}{x(x-4)}$ simplify

$n(x) = \frac{x}{x(x-4)} - \frac{4}{x(x-4)}$ common denominator

$n(x) = \frac{x-4}{x(x-4)}$ subtract

$n(x) = \frac{1}{x}$ simplify

3

(a) a = 3, b = –5 , c = –4

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

$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(3)(-4)}}{2(3)}$

$x = \frac{5 \pm \sqrt{73}}{6}$

$x = \frac{5 + \sqrt{73}}{6} \simeq 2.26$, $x = \frac{5 - \sqrt{73}}{6} \simeq -0.59$

S.S. $= \{2.26, -0.59\}$

(b) $\because$ The domain of the $n(x)$ is $\mathbb{R} - \{2, 3\}$

$\therefore$ $n(2)$ and $n(3)$ are undefined

$\because n(2) = \frac{4}{2^2 + 2a + b}$

$4 - 2a + b = 0 \quad \therefore 2a + b = -4$ (1)

$\because n(3) = \frac{5}{3^2 + 3a + b}$ Type equation here.

$9 + 3a + b = 0 \quad \therefore 3a + b = -9$ (2)

$2a + b = -4$ $(x - 1)$

$3a + b = -9$

$-2a - b = 4$ (1)

$3a + b = -9$ (2) by adding (1) and (2)

$a = -5$ by substituting in the first equation $-10 + b = -4$

$b = 6$

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

domain $= \mathbb{R} - \{0, 3\}$ $\quad n^{-1}(x) = \frac{(x^2+2)}{x}$

(b) $x = (7 - y)$ (1)

$x^2 + y^2 = 25$ (2)

Substitute (1) in (2)

$(7 - y)^2 + y^2 = 25$

$49 - 14y + y^2 + y^2 = 25$

$2y^2 - 14y + 49 = 25$

$2y^2 - 14y + 24 = 0$ $(\div 2)$

$y^2 - 7y + 12 = 0$

$(y - 4)(y - 3) = 0$

$y = 4$, $y = 3$ substitute in (1)

$x = 3$, $x = 4$

S.S. $= \{(3, 4), (4, 3)\}$

5 (a) $n(x) = \frac{x(x+3)}{(x+3)(x-3)} \div \frac{2x}{x+3}$ factorize

Domain of $n = \mathbb{R} - \{-3, 3, 0\}$

$n(x) = \frac{x(x+3)}{(x+3)(x-3)} \times \frac{x+3}{2x}$ switch to multiplication

$n(x) = \frac{x+3}{2(x-3)} = \frac{x+3}{2x-6}$ simplify

(b) $5x - y = 3$ $(\times 3)$

$15x - 3y = 9$ (1)

$x + 3y = 7$ (2)

By adding (1) , (2)

$16x = 16$

$x = 1$

Substitute in (2)

$1 + 3y = 7$

$3y = 6$

$y = 2$

S.S. $= \{(1,2)\}$

Model Answer 3

1 Choose the correct answer:

(1) 4

(2) 1,8

(3) 1 – P (A)

(4) P (A)

(5) $\{(5, 2)\}$

(6) –2

2 **(a)** $a = 1 , b = -2 , c = -6$

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

$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-6)}}{2(1)}$

$x = \frac{2 \pm \sqrt{28}}{2}$

$x = 1 + \sqrt{7} \simeq 3.6 \quad , \quad x = 1 - \sqrt{7} \simeq -1.6$

S.S. = $\{3.6 , -1.6\}$

(b) Let the length = L and the width = W

$L = (W + 4)$ (1)

$2 (L + W) = 28$ (2)

By substituting (1) in (2)

$2 (W + 4 + W) = 28$

$2W + 4 = 14$

$2W = 10$

$W = 5$ cm

By substituting in (1)

$L = 5 + 4 = 9$ cm

Area = $L \times W = 9 \times 5 = 45$ cm^2

3 **(a)** $\because$ Z $(f) = \{0 , 1\}$ by substituting $x = 0$

$\therefore$ b = 0

substituting $x = 0$

$a + 1 + 0 = 0 \qquad a = -1$

(b) $y = (x + 3)$ (1)

$x^2 + y^2 - xy = 13$ (2)

Substitute (1) in (2)

$x^2 + (x + 3)^2 - x(x + 3) = 13$

$x^2 + x^2 + 6x + 9 - x^2 - 3x - 13 = 0$

$x^2 + 3x - 4 = 0$

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

$x = -4 , x = 1$ substitute in (1)

$y = -1 , y = 4$

S.S. $= \{(-4 , -1) , (1 , 4)\}$

4 **(a)** $n(x) = \frac{(x-2)(x^2+2x+4)}{(x+3)(x-2)} \times \frac{x+3}{(x^2+2x+4)}$ factorize

Domain of $n = \mathbb{R} - \{-3 , 2\}$

$n(x) = 1$ simplify

(b): $2x - y = 3$ $(\times 2)$

$4x - 2y = 6$ (1)

$x + 2y = 4$ (2)

By adding (1) , (2)

$5x = 10$

$x = 2$

Substitute in (2)

$2 + 2y = 4$

$2y = 2$

$y = 1$

S.S. $= \{(2 , 1)\}$

5 **(a)** $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$P(A \cup B) = 0.3 + 0.6 - 0.2 = 0.7$

$P(A - B) = P(A) - P(A \cap B)$

$P(A - B) = 0.3 - 0.2 = 0.1$

(b) $n(x) = \frac{x(x+2)}{(x+2)(x-2)} + \frac{x+3}{(x-3)(x-2)}$ factorize

Domain of $n = \mathbb{R} - \{3 , 2 , -2\}$

$n(x) = \frac{x}{(x-2)} + \frac{x+3}{(x-3)(x-2)}$ simplify

$n(x) = \frac{x(x-3)}{(x-2)(x-3)} + \frac{x+3}{(x-3)(x-2)}$ common denominator

$n(x) = \frac{x^2 - 3x + (x+3)}{(x-2)(x-3)}$ add

$n(x) = \frac{x^2 - 2x + 3}{(x-2)(x-3)} = \frac{x^2 - 2x + 3}{x^2 - 5x + 6}$

$n(-2)$ is undefined because $-2 \notin$ the domain

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Model Answer 1

Geometry

1 **Choose the correct answer:**

(1) radius. (2) 60° (3) 3

(4) Touching internally (5) equal to (6) 108°

2 **(a)** $\because \overline{MY} \cap$ circle M = {Z}

$\therefore$ MY = MZ + ZY

$\because$ MZ = MX = 5 cm (radii)

$\therefore$ MY = 5 + 8 = 13 cm

$\because (MY)^2 = (13)^2 = 169$

$(MX)^2 = (5)^2 = 25$ $(XY)^2 = (12)^2 = 144$

$(MX)^2 + (XY)^2 = 25 + 144 + 169 = (MY)^2$

$\therefore m\angle MXY = 90°$ (The converse of the pythagoras' theorem)

$\because \overline{XY} \perp \overline{MX}$ and $\overline{MX}$ is a radius

$\therefore \overline{XY}$ is a tangent to the circle at X.

(b) $\because$ The two circles are touching internally at A

$\therefore A \in \overline{MN}$, $\overline{MN} \perp \overline{AB}$

$\because$ MN = 10 - 6 = 4 cm (Touching internally)

$\because$ Area $\Delta BMN = \frac{1}{2} \times MN \times AB$

$\therefore 24 = 4 \times \frac{1}{2} \times AB$ $\therefore$ AB = 12 cm

3 **(a)** $m(A) = \frac{1}{2}[m(\overset{\frown}{CH}) - m(\overset{\frown}{BD})]$

$30° = \frac{1}{2}[120 - m(\overset{\frown}{BD})]$

$60° = 120° - m(\overset{\frown}{BD})$

$m(\overset{\frown}{BD}) = 60°$

$m(\overset{\frown}{CH}) + m(\overset{\frown}{HD}) + m(\overset{\frown}{BD}) + m(\overset{\frown}{BC}) = 360°$

$\because m(\overset{\frown}{HD}) = m(\overset{\frown}{BC}) = \frac{360° - (120° + 60°)}{2}$

$m(\overset{\frown}{HD}) = m(\overset{\frown}{BC}) = 90°$

$\because \angle C$ is an inscribed angle subtended by $\overset{\frown}{HDB}$

$\because m(\angle C) = \frac{1}{2} m(\overset{\frown}{HDB}) = \frac{1}{2} \times 150° = 75°$

In Δ ACH:

$m(\angle H) = 180° - (30° + 75°) = 75°$

$m(\angle H) = m(\angle HCB) = 75°$

and AH = AC (1)

$m(\overset{\frown}{BC}) = m(\overset{\frown}{HD})$

HD = BC (2)

By subtracting (2) from (1)

AH – AB = AC – BC AD = AB

(b) $\because \overline{AB}$ is a diameter

$\therefore m(\overset{\frown}{AD}) + m(\overset{\frown}{CD}) + m(\overset{\frown}{BC}) = 180°$

$m(\angle A) = 30°$

$\because m(\overset{\frown}{BC}) = 60°$

$\because m(\overset{\frown}{CD}) + m(\overset{\frown}{AD}) = 180° - 60° = 120°$

$\therefore m(\overset{\frown}{AD}) = m(\overset{\frown}{CD}) = \frac{120°}{2} = 60°$

$m\angle ABD = \frac{1}{2} m(\overset{\frown}{AD}) = 30°$

$m\angle CDB = \frac{1}{2} m(\overset{\frown}{BC}) = 30°$

$\because m(\angle DBA) = m(\angle CDB) = 30°$ They are alternate

$\therefore \overline{AB} // \overline{CD}$

4 (a) $\because AB = AC$

$\therefore m(\angle B) = m(\angle C)$

$\therefore m(\overset{\frown}{DHC}) = m(\overset{\frown}{HDB})$

by subtracting $m(\overset{\frown}{HD})$ from both sides

$\therefore m(\overset{\frown}{DB}) = m(\overset{\frown}{HC})$

(b) $\because$ circumference = 44 cm

$\therefore 2\pi r = 44$

$r = 44 \div (2 \times \frac{22}{7}) = 7$ cm

$\because \overline{AB}$ is a diameter of length 14 cm and $\overline{BC}$ is a tangent

$\therefore m(\angle B) = 90°$

$\therefore m(\angle ACB) = 30°$

$\therefore AC = 28$ cm and $(BC)^2 = (AC)^2 - (AB)^2$

$BC = \sqrt{28^2 - 14^2} = 14\sqrt{3}$ cm

5 (a) In ΔABD

$\because AB = AD, m(\angle DAB) = 80°$

$\therefore m(\angle D) = m(\angle ABD) = \frac{180° - 80°}{2} = 50°$

$\because m(\angle D) = m(\angle C) = 50°$

$\because$ They are both drawn angles on the same base $\overline{AB}$ and on one side of it.

$\because$ They points A, B , C and D have a circle passing through them.

(b) Mention any two cases of the following:

1-If there is a point in the plane equidistant from all vertices.

2- If there is an exterior angle its measure = the measure of the niterior angle at the opposite vertex.

3 - If there are two opposite angles are supplementary.

4- If there are two angles equal in measure and drawn on the same base and one side of this base.

Model Answer 2

1 Choose the correct answer:

(1) MA = 3 cm. (2) an obtuse (3) $\overline{AB}$

(4) three non-collinear points (5) 140° (6) 30°

2 **(a)** In Δ ABE:

∵ m (∠ ABE) = m (∠ AEB)

∴ AB = AE

In the larger circle:

∵ AB = AE

∵ $\overline{MX}$ ⊥ $\overline{AB}$ and $\overline{MY}$ ⊥ $\overline{AE}$

∴ MX = MY

In the smaller circle:

∵ MX = MY

∵ $\overline{MX}$ ⊥ $\overline{AB}$ and $\overline{MY}$ ⊥ $\overline{AE}$

∴ CD = ZL

(b) ∵ $\overline{AB}$ is a diameter in circle M

∴ m ($\overset{\frown}{ACB}$) =180°

Draw ($\overline{MC}$) , ($\overline{MD}$)

∵ m ($\overset{\frown}{AC}$) = 80°

∴ m (∠ AMC) = 80°

∴ m (∠ CME) = 180° – 80° = 100°

In triangle Δ CME:

∴ m (∠ ECM) = 180° – (30° + 100°) = 50°

In triangle Δ CMD:

∵ MC = MD radii

∴ m (∠ CMD) = 180° – (50° + 50°) = 80°

∴ m ($\overset{\frown}{CD}$) = 80°

3 **(a) Draw $\overline{BM}$**

Proof:

In Δ MAB:

∵ $\overline{MA}$ = $\overline{MB}$ (radii), $\overline{MC}$ ⊥ $\overline{AB}$

∴ m (∠ AMC) = m (∠ BMC) = $\frac{1}{2}$ m (∠ AMB) (1) isosceles triangle properties

∵ inscribed ∠ ADB and central ∠ AMB are subtended at ($\overset{\frown}{AB}$)

∴ m (∠ ADB) = $\frac{1}{2}$ m (∠ AMB) (2)

∴ From (1) and (2) we get: m (∠ AMC) = m (∠ ADB).

(b) $\because \overline{CM} // \overline{AB}$

$\therefore$ m (∠ CMA) = m (∠ MAB) alternate angles

$\because$ m (∠ CMA) = 2 × m (∠ CBA) central and inscribed

$\therefore$ m (∠ MAB) = 2 × m (∠ CBA)

$\therefore$ m (∠ MAB) > m (∠ CBA)

In Δ ABE: $\therefore$ BE > AE

4 (a) $\because \overline{AB}$, $\overline{BC}$ and $\overline{AD}$ are three tangents to the circle

$\therefore$ AD = AF = 5 cm.

BD = BE = 4 cm

CE = CF = 3 cm

$\because$ Perimeter of ⊿ABC = AB + BC + AC

$\therefore$ Perimeter of ⊿ABC = 8 + 9 + 7 = 24 cm.

(b) In ⊿ABC:

$\because$ AB = AD

$\therefore$ m (∠ ABD) = m (∠ MDB) = 30°

m (∠ BAD) = 180° – (30° + 30°) = 120°

m (∠ A) + m (∠ C) = 180° (opposite angles)

ABCD is a cyclic quadrilateral.

5 **(a) In the circle M:**

$\because$ X and y are midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

$\therefore \overline{MX} \perp \overline{AB}$ and $\overline{MY} \perp \overline{AC}$

And m (∠ MXA) = m (∠ MYA) = 90°

In the quadrilateral AXMY:

$\because$ m (∠ A) + m (∠ XMY) + m (∠ MXA) + m (∠ MYA) = 360°

$\therefore$ m (∠ DME) = 360° – (90 ° + 90 ° + 70°) = 110°

$\because$ AB = AC

$\overline{MX} \perp \overline{AB}$ and $\overline{MY} \perp \overline{AC}$

$\therefore$ MX = MY $\because$ MD = ME = r

By subtracting MX from MD and MY from ME we get that: XD = YE

(b) $\overline{AB}$ and $\overline{AC}$ are two tangents

$\therefore$ AB = AC and m (∠ ABC) = m (∠ ACB) = $\frac{180° - 50°}{2}$ = 65°

$\because$ EBCD is a cyclic quadrilateral.

$\therefore$ m (∠ EDC) + m (∠ CBE) = 180°

m (∠ CBE) = 180° – 115° = 65°

$\because$ m (∠ ABC) = m (∠ EBC) = 65°

$\therefore \overrightarrow{BC}$ bisects ∠ ABE

$\because$ ∠ BEC is an inscribed angle subtended by ($\overset{\frown}{BC}$) and ∠ ABC is an angle of tangency subtended by ($\overset{\frown}{BC}$)

$\therefore$ m (∠ ABC) = m (∠ BEC) = 65°

$\because$ m (∠ EBC) = m (∠ BEC) = 65°

$\therefore$ CB = CE

Model Answer 3

1 Choose the correct answer:

(1) equidistant from	(2) $\frac{1}{4}$	(3) 22
(4) Axis of symmetry	(5) zero	(6) 54°

2 **(a)** $\because \overrightarrow{XY}$ and $\overrightarrow{XZ}$ are two tangents

$\therefore XY = XZ$

And $m(\angle xzy) = m(\angle xyz) = \frac{180° - 40°}{2} = 70°$

$\therefore$ ZYED is a cyclic quadrilateral.

$\therefore m(\angle ZDE) + m(\angle ZYE) = 180°$

And $m(\angle EYZ) = 180° - 110° = 70°$ (1)

$\because \angle ZEY$ is an inscribed angle subtended by $(\overset{\frown}{ZY})$

and $\angle XZY$ is an angle of tangency subtended by $(\overset{\frown}{ZY})$

$\therefore m(\angle ZYE) = m(\angle XZY) = 70°$ (2)

From (1) and (2) we get that:

$m(\angle ZYE) = m(\angle ZEY)$

(b) $\overrightarrow{AD}$ **is a tangent:**

$\therefore \angle DAC$ is an angle of tangency subtended by $(\overset{\frown}{ABC})$

and $m(\angle DAC) = \frac{1}{2} m(\overset{\frown}{ABC}) = 130°$

And $m(\overset{\frown}{ABC}) = 2 \times 130° = 260°$

$\because m(\overset{\frown}{AC}) + m(\overset{\frown}{ABC}) = 360°$

$\therefore m(\overset{\frown}{AC}) = 360° - 260° = 100°$

$\because \angle B$ is an inscribed angle subtended by $(\overset{\frown}{AC})$

$\therefore m(\angle B) = \frac{1}{2} m(\overset{\frown}{AC}) = 50°$

3 **(a)** $\because \overleftrightarrow{AD}$ is a tangent and, $\overline{AB}$ is the chord of tangency.

$\therefore m(\angle DAB) = m(\angle C)$ (1) an inscribed angle and a central angle subtended by the same arc $(\overset{\frown}{AB})$

$\because \overline{XY} \parallel \overline{BC}$, $\overline{AC}$ is a transversal

$\therefore m(\angle AYX) = m(\angle C)$ corresponding angle (2)

From (1) and (2) and we get: $m(\angle DAB) = m(\angle AYX)$

$\because m(\angle DAX) = m(\angle AYX)$

$\therefore \overleftrightarrow{AD}$ is a tangent to the circle passing through the points A, X and Y

(b): Proof:

$\because \overline{XA}$ and $\overline{XB}$ are two tangent segments.

$\therefore XA = XB$

In Δ XAB:

$\because m(\angle XAB) = m(\angle XBA)$, $m(\angle X) = 70°$

$\therefore m(\angle XAB) = \frac{180° - 70°}{2} = 55°$ (1)

$\because$ ABCD is a cyclic quadrilateral, $m(\angle C) = 125°$

$\therefore m(\angle DAB) = 180° - 125° = 55°$ (2)

From (1) and (2)

$\because m(\angle XAB) = m(\angle DAB) = 55°$

$\therefore \overline{AB}$ bisects $\angle$ DAX

$\because m(\angle XBA) = m(\angle DAB) = 55°$ alternate angles

$\therefore \overline{AD} // \overline{XB}$

4 **(a)** $\because$ MA = MB (radii)

$\therefore m(\angle MAB) = m(\angle MBA) = 50°$

$\therefore m(\angle AMB) = 180° - (50° + 50°) = 80°$

$\therefore m(\angle BCA) = 40°$ an inscribed angle and a central angle subtended by the arc $(\overset{\frown}{AB})$

(b) $\because m(\angle E) = 30°$, $m(\overset{\frown}{AC}) = 80°$

$\therefore 30° = \frac{180° - m(\overset{\frown}{BD})}{2}$

$\therefore m(\overset{\frown}{BD}) = 20°$

5 **(a)** $\because$ The inscribed circle of the triangle ABC touches its sides at X , Y and Z

$\therefore$ AX = AZ = 3 cm , BX = BY = 4cm , CZ = CY

$\therefore$ CZ = 8 – 3 = 5 cm = CY

$\therefore$ BC = 4 + 5 = 9 cm

(b) $\because$ E is the midpoint of $\overline{XY}$

$\therefore \overline{ME} \perp \overline{XY}$

$\because \overline{AB}$ is a common chord of circles M , N

$\therefore \overline{AB} \perp \overline{MN}$

$\because m(\angle EMN) = 130°$

$\therefore m(\angle C) = 360 - (90 + 90 + 130) = 50°$