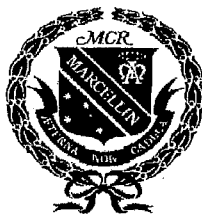


MARCELLIN COLLEGE RANDWICK



YEAR 11
ACCELERATED MATHEMATICS

PRELIMINARY ASSESSMENT TASK 1
2014

STUDENT NAME: _____ MARK: _____ /36

TEACHER: _____

TIME ALLOWED: 45 minutes
WEIGHTING: 30 %

Directions:

- Answer multiple choice questions on the page provided.
- Use a new sheet for additional questions.
- Show all necessary working. Where more than one mark is allocated to a question, full marks may not be awarded for answers only.
- Marks may not be awarded for careless or badly arranged work.
- Calculators may be used

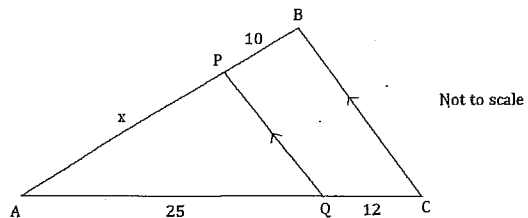
Section 1 (32 marks)

Allow about 40 minutes for this section
Show all working

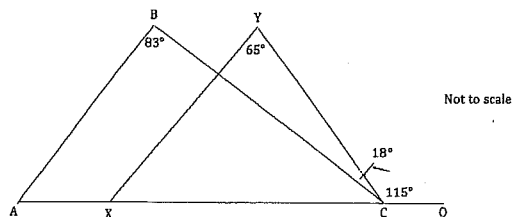
- | | Marks |
|---|--------------------------|
| 1. Simplify | 2 |
| i) $\frac{2x^2-3xy}{xy-y^2} \div \frac{4x-6y}{2x^2-2xy}$ | 2 |
| ii) $\frac{2}{n} - \frac{1}{n+1}$ | |
| 2. Solve the following set of equations simultaneously | 4 |
| | $3x - y = 1$
$xy = 2$ |
| 3. Show that $\frac{2}{3-2\sqrt{2}} - \frac{8}{\sqrt{2}}$ is rational | 2 |
| 4. Solve $ 2x - 1 < 3$ | 2 |
| 5. Find the value of x if $a^{4x-6} = \frac{1}{a^2}$ | 2 |
| 6. Find $\lim_{x \rightarrow -1} \frac{x^2+2x+1}{x+1}$ | 2 |

7. i) Find the equation of a circle with centre $(-1, 2)$ and radius 3 1
 ii) Sketch the circle, showing all relevant information. 2
 iii) Hence or otherwise, state the domain and range of the circle 2

8. For the following diagram



- i) Prove that $\triangle ABC \parallel \triangle APQ$ 3
 ii) Find the value of x (to 2 dec. pl) 2
9. Two roads intersect at right angles. Two cars start from the intersection at the same time. One car travels at 60km/h along one road and the other car at 80km/h along the other. How far apart are the cars after 45 minutes? 2
10. For the following diagram 4



Prove that $AB \parallel XY$

Section II – Multiple Choice (4 marks)

Use the multiple choice answer sheet for Questions 11 – 14
 Allow about 5 minutes for this section

11. Which of the following is equivalent to $\sqrt{3} + \sqrt{27} - \sqrt{18}$?

- (A) $4\sqrt{3} - 3\sqrt{2}$, (B) $\sqrt{12}$ (C) $\sqrt{3}$ (D) $10\sqrt{3} - 9\sqrt{2}$

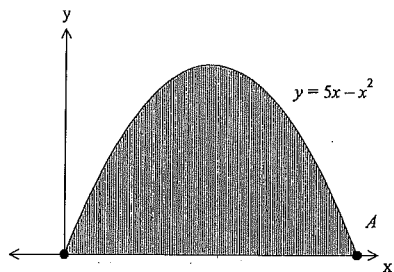
12. Which graph represents $y = |x| - 2$?

- (A) (B)
- (C) (D)

13. What is the value of $f(2a + 1)$ if $f(x) = 3x - 2$?

- (A) $6a - 2$ (B) $6a - 1$ (C) $6a + 1$ (D) $6a + 2$

14. The diagram shows the graph of the function $y = 5x - x^2$.



Which pair of inequalities specify the shaded region?

- (A) $y \leq 5x - x^2$ and $y \leq 0$ (B) $y \leq 5x - x^2$ and $y \geq 0$
(C) $y \geq 5x - x^2$ and $y \leq 0$ (D) $y \geq 5x - x^2$ and $y \geq 0$

Name _____

YEAR 11
ACCELERATED MATHEMATICS
PRELIMINARY
TASK 1
MULTIPLE CHOICE ANSWER SHEET

Section II (4 marks)

Allow about 5 minutes for this section

Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

- 11. A B C D ✓
- 12. A B C D ✓
- 13. A B C D ✓
- 14. A B C D ✓

4

1. i $\frac{x(2x-3y)}{y(2x-y)} \times \frac{2x(2x-y)}{2(2x-3y)}$

$\frac{x^2}{y}$ ✓✓

ii $\frac{2}{n} - \frac{1}{n+1}$

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

$\frac{2n+2-n}{n(n+1)}$ ✓✓

$\frac{n+2}{n(n+1)}$ ✓✓

2. $x = \frac{2}{y}$

$\left[\frac{6}{y} - y = 1\right] \times y$

$6 - y^2 = y$

$y^2 + y - 6 = 0$

$(y-2)(y+3) = 0$

$y = 2, \text{ or } -3$
 $x = 1 \text{ or } -\frac{2}{3}$

③
not exactly correct

when $x=1, y=2$
and $x=-\frac{2}{3}, y=3$
(when $x=1, y \neq -3$!)

3. $\frac{2}{3-2\sqrt{2}} \times \frac{3+2\sqrt{2}}{3+2\sqrt{2}} = \frac{8}{\sqrt{2}(2\sqrt{2})}$

$\frac{6+4\sqrt{2}}{1} - \frac{8\sqrt{2}}{2}$

$\frac{12+8\sqrt{2}-8\sqrt{2}}{2}$

$2(6+4\sqrt{2}-4\sqrt{2}) = 12$ ✓✓
is it rational

4. $2x-1 < 3$ $2x-1 > -3$

$2x < 4$ $2x > -2$

$x < 2$ $x > -1$

$-1 < x < 2$ ✓✓
(A/A) (B/B) (C/C) (D/D)

5. $a^{4x-6} = a^{-2}$

$4x-6 = -2$

$4x = 4$

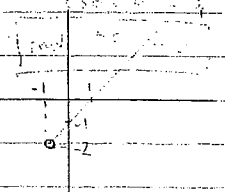
$x = 1$ ✓✓

6. $\lim_{x \rightarrow -1} \frac{x^2+2x+1}{x+1}$

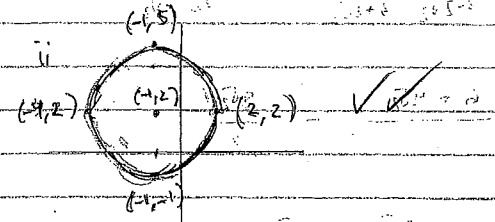
$= \lim_{x \rightarrow -1} \frac{(x+1)(x+1)}{(x+1)}$

$\lim_{x \rightarrow -1} (x+1) = 0$

①



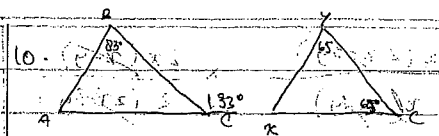
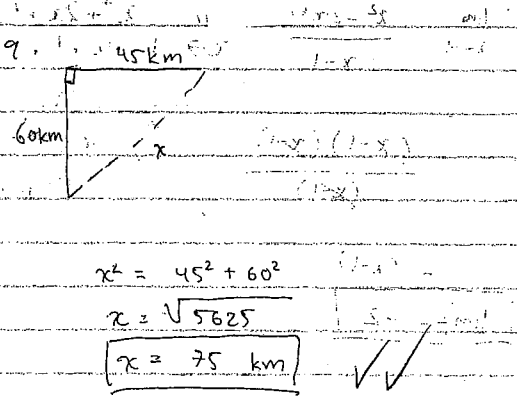
7. $(x+1)^2 + (y-2)^2 = 9$ ✓



iii. $\{x \mid -4.5 < x < 2\}$ ✓
 $\{y \mid -1 < y < 5\}$ ✓

ii. $\angle BAC = \angle PAQ$ (common) ✓
 $\angle BCA = \angle PQA$ (corresponding) ✓
 $\angle ABC = \angle APQ$ (∠ sum of triangle) ✓
 $\therefore \triangle ABC \parallel \triangle APQ$ (AAA) ✓✓✓

ii. $\frac{x}{10} = \frac{25}{12}$ ✓
 $12x = 250$ ✓
 $x = 20.8\bar{3}$ (2 d.p.) ✓



$\angle BCA = 180 - 133$
 $= 47^\circ$ why? (straight line) ✓
 $\therefore \angle BAC = 180 - (47 + 65)$
 $= 50^\circ$ (angle sum of \triangle)

$\angle YXC = 180 - (65 + 65)$
 $= 50^\circ$ (angle sum of \triangle)

$\angle BAC = \angle YXC$ (50°) ✓
 $\therefore AB \parallel XY$ (4th) ✓
 \therefore corresponding \angle 's ✓
 $AB \parallel XY$ ✓

This your proof need more detailing your proofs (as per Q8)