BEATTY SECONDARY SCHOOL
MID-YEAR EXAMINATION 2015

SUBJECT : Mathematics

PAPER : 1

SETTER : Mr Anthony Goh

LEVEL : Secondary 2 Express

DURATION : 1 hour 15 minutes

DATE : 15 May 2015

CLASS :	NAME :	REG NO :

.....

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number in the spaces on the top of this page.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

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For π, use either your calculator value or 3.142, unless the question requires the answer in terms of π.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is **50**.

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50

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Answer all questions.

1 **(a)** Expand and simplify $(a+3)(2a-3)$.

(b) Simplify $(-4x^2)(4x)^2$.

Answer (a) ..... [1]

(b) ..... [2]

2 Solve each of the following equations.

(a) $(2p+3)(p-5)=0$,

(b) $x^2=7x$.

Answer (a) $p=$ ..... [1]

(b) $x=$ ..... [2]

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3 Factorise **completely** each of the following expressions.

(a) $5w^2 - 23w + 12$

(b) $50c^2 - 98d^2$

Answer (a) ..... [1]

(b) ..... [2]

4 Solve $\frac{2}{5z-1} = -\frac{3}{4}$.

Answer $z =$ ..... [2]

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5 A map has a scale of 1:400 000.

(a) Given that the actual distance between two locations A and B is 14 km, find the distance, in cm, between A and B on the map.

(b) Given that the area of a garden on the map is 1.5 cm^2, calculate its actual area in km^2.

Answer (a) ..... cm [2]

(b) ..... km^2 [2]

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6 The kinetic energy, E joules, of a particular object is directly proportional to the square of its velocity v m/s. Given that $E = 75$ joules when $v = 2.5$ m/s, find

(a) the equation connecting E and v,

(b) the value of v, in m/s, when $E = 432$ joules.

Answer (a) ..... [2]

(b) $v =$ ..... m/s [2]

7 **(a)** Factorize $x^2 - 9$.

(b) Hence, find 2 factors of 2491, other than 1 and 2491.

Answer (a) ..... [1]

(b) ..... , ... [2]

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8 4 workers can complete an assignment in 15 days. Assuming all the workers work at the same rate, find

(a) the number of days taken by 3 workers to complete the assignment,

(b) the number of additional workers needed if the assignment is to be completed in 10 days.

Answer (a) ..... days [2]

(b) ..... additional workers [2]

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9 **(a)** Express $\frac{1}{2x+1}+\frac{2}{3x-2}$ as a single fraction in its simplest form.

(b) Simplify $\frac{a^3b^2c^3}{24c^4}\div\frac{a^3b}{8c}$.

Answer (a) ..... [2]

(b) ..... [2]

4

[Turn Over

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10 Simplify each of the following expressions.

(a) $\dfrac{2n^2+3n}{16n+24}$,

(b) $\dfrac{e^4f^2-e^3f^3}{e^2f^4-e^3f^3}$.

Answer (a) ..... [2]

(b) ..... [2]

11 Solve $(x+3)(x-5)=20$.

Answer $x =$ ..... [3]

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12 Given that $p = \sqrt{\dfrac{2-q}{3+q}}$,

(a) find the value of p when $q = -\dfrac{5}{2}$,

(b) express q in terms of p.

Answer (a) $p =$ ..... [2]

(b) $q =$ ..... [3]

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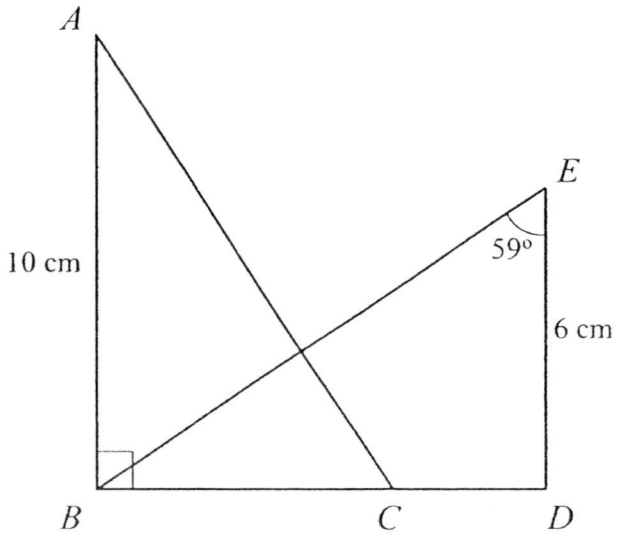
13 In the figure below, ΔABC is congruent to ΔBDE,

$\angle ABC = 90^\circ$, $\angle BED = 50^\circ$, $AB = 10$ cm and $DE = 6$ cm.

Find

(a) $\angle BAC$,

(b) the length of CD.



Answer (a) $\angle BAC$ = ... [2]

(b) CD = ... cm [2]

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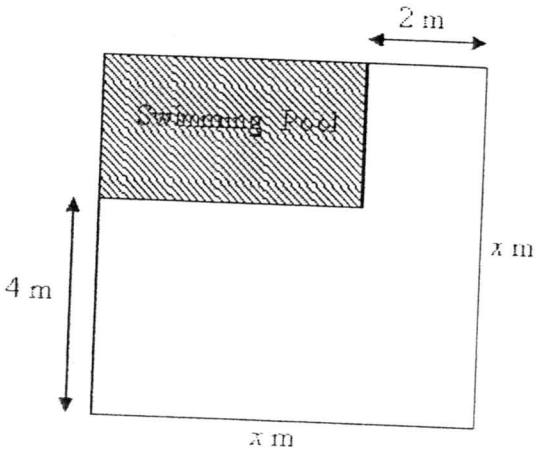
14 Ahmad decided to build a swimming pool in his house on a square plot of land of side x metres.

(a) Write down an expression, in terms of x, for the area of the swimming pool.

(b) The area of the swimming pool was found to be 80 m^2.

Show that $x^2 - 6x - 72 = 0$.

(c) Hence, find the value of x.



Answer (a) Area = ... m^2 [1]

(b) Answer to be shown above [1]

(c) x = ... [2]

End of Paper

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ANSWER KEY

1. a) $2a^2+3a-9$ b) $-64x^4$	2. a) $p=-\frac{3}{2}$ or 5 b) $x=0$ or 7	3. a) $(5w-3)(w-4)$ b) $2(5c+7d)(5c-7d)$
4. $z=-\frac{1}{3}$	5. a) 3.5 cm b) 24 km^2	6. a) $E=12v^2$ b) $v=\pm 6$
7. a) $(x+3)(x-3)$ b) 47 and 53	8. a) 20 days b) 2 additional workers	9. a) $\frac{7x}{(2x+1)(3x-2)}$ b) $\frac{b}{3}$
10. a) $\frac{n}{8}$ b) $-\frac{e}{f}$	11. $x=7$ or -5	12. a) 3 b) $\frac{2-3p^2}{p^2+1}$
13. a) 31° b) 4 cm	14. a) $(x-2)(x-4)$ c) 12	

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Marking Scheme

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Answer all questions.

1 **(a)** Expand and simplify $(a+3)(2a-3)$

(b) Simplify $(-4x^2)(4x)^2$

(a)
$$(a+3)(2a-3) = 2a^2 - 3a + 6a - 9$$
$$= 2a^2 + 3a - 9 \qquad [B1]$$

(b)
$$(-4x^2)(4x)^2 = (-4x^2)(16x^2) \qquad [M1]$$
$$= -64x^4 \qquad [A1]$$

Answer (a) ..... [1]

(b) ..... [2]

2 Solve each of the following equations.

(a) $(2p+3)(p-5) = 0$

(b) $x^2 = 7x$

(a)
$$(2p+3)(p-5) = 0$$
$2p+3=0$ OR $p-5=0$

$p = -\frac{3}{2}$ $\qquad p = 5 \qquad [B1]$

(b)
$$x^2 = 7x$$
$$x^2 - 7x = 0$$
$$x(x-7) = 0 \qquad [M1]$$
$$x = 0 \text{ or } 7 \qquad [A1]$$

Answer (a) $p =$ ..... [1]

(b) $x =$ ..... [2]

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3 Factorise **completely** each of the following expressions.

(a) $5w^2 - 23w + 12$

(b) $50c^2 - 98d^2$

(a) $5w^2 - 23w + 12 = (5w - 3)(w - 4)$ [B1]

(b) $50c^2 - 98d^2 = 2(25c^2 - 49d^2)$ [M1]

$= 2(5c + 7d)(5c - 7d)$ [A1]

Answer (a) ..... [1]

(b) ..... [2]

4 Solve $\frac{2}{5z-1} = -\frac{3}{4}$

$\frac{2}{5z-1} = -\frac{3}{4}$

$15z - 3 = -8$ [M1]

$15z = -5$

$z = -\frac{1}{3}$ [A1]

Answer $z =$ ..... [2]

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5 A map has a scale of 1:400 000.

(a) Given that the distance between two locations A and B is 14 km, find the distance, in cm, between A and B on the map.

(b) Given that the area of a garden on the map is 1.5 cm^2, calculate its actual area in km^2.

(a) Map scale = 1 cm : 400 000 cm

= 1 cm : 4 km

$= \frac{1}{4}$ cm : 1 km

Distance on map = $14 \times \frac{1}{4}$ [M1]

= 3.5 cm [A1]

(b) Map scale = 1 cm : 4 km

Area scale = 1 cm^2 : 16 km^2

Actual area = 1.5×16 [M1]

= 24 km^2 [A1]

Answer (a) ..... cm [2]

(b) ..... km^2 [2]

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6 The kinetic energy, E joules, of a particular object is directly proportional to the square of its velocity v m/s. Given that $E = 75$ joules when $v = 2.5$ m/s, find

(a) the equation connecting E and v,

(b) the value of v, in m/s, when $E = 432$ joules.

$E = kv^2$

When $E = 75$, $v = 2.5$,

(a) $75 = k(2.5)^2$ [M1]

$k = 12$

$\therefore E = 12v^2$ [A1]

$432 = 12v^2$ [M1]

(b) $v^2 = 36$

$v = 6$ [A1]

Accept $v = -6$ as well, as it is not obvious to the students whether v can be positive or negative.

Answer (a) ..... [2]

(b) v = ... m/s [2]

7 **(a)** Factorize $x^2 - 9$.

(b) Hence, find 2 factors of 2491, other than 1 and 2491.

(a) $x^2 - 9 = (x+3)(x-3)$ [B1]

(b) $2491 = 2500 - 9$ [M1]

$= 50^2 - 3^2$

$= (50-3)(50+3)$

$= (47)(53)$

$\therefore$ the other 2 factors are 47 and 53. [A1]

Answer (a) ..... [1]

(b) ..... , ... [2]

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8 4 workers can complete an assignment in 15 days. Assuming all the workers work at the same rate, find

(a) the number of days taken by 3 workers to complete the assignment,

(b) the number of additional workers needed if the assignment is to be completed in 10 instead of 15 days.

(a)

Workers	Days	
4	15	
1	$15 \times 4 = 60$	[M1]
3	$60 \div 3 = 20$	[A1]

(b)

Workers	Days	
$3 \times 2 = 6$	$20 \div 2 = 10$	[M1]

$\therefore$ (6-4) = 2 extra workers are needed. [A1]

Answer (a) ..... [2]

(b) ..... [2]

9 **(a)** Express $\frac{1}{2x+1} + \frac{2}{3x-2}$ as a single fraction in its simplest form.

(b) Simplify $\frac{a^3b^2c^3}{24c^4} \div \frac{a^3b}{8c}$

(a)
$$\frac{1}{2x+1} + \frac{2}{3x-2} = \frac{(3x-2)}{(2x+1)(3x-2)} + \frac{2(2x+1)}{(2x+1)(3x-2)} \quad \text{[M1]}$$
$$= \frac{3x-2+4x+2}{(2x+1)(3x-2)}$$
$$= \frac{7x}{(2x+1)(3x-2)} \quad \text{[A1]}$$

(b)
$$\frac{a^3b^2c^3}{24c^4} \div \frac{a^3b}{8c} = \frac{a^3b^2c^3}{24c^4} \times \frac{8c}{a^3b} \quad \text{[M1]}$$
$$= \frac{b}{3} \quad \text{[A1]}$$

Answer (a) ..... [2]

(b) ..... [2]

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10 Simplify each of the following expressions.

(a) $\dfrac{2n^2+3n}{16n+24}$

(b) $\dfrac{e^4f^2-e^3f^3}{e^2f^4-e^3f^3}$

(a) $\dfrac{2n^2+3n}{16n+24}=\dfrac{n(2n+3)}{8(2n+3)}$ [M1]

$=\dfrac{n}{8}$ [A1]

(b) $\dfrac{e^4f^2-e^3f^3}{e^2f^4-e^3f^3}=\dfrac{e^3f^2(e-f)}{e^2f^3(f-e)}$ [M1]

$=-\dfrac{e(e-f)}{f(e-f)}$

$=-\dfrac{e}{f}$ [A1]

Answer (a) ..... [2]

(b) ..... [2]

11 Solve $(x+3)(x-5)=20$.

$(x+3)(x-5)=20$

$x^2-2x-15=20$ [M1]

$x^2-2x-35=0$

$(x-7)(x+5)=0$ [M1]

$x=7$ or -5 [A1]

Answer $x=$ ..... [3]

10

[Turn over

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12 Given that $p = \sqrt{\dfrac{2-q}{3+q}}$,

(a) find the value of p when $q = -\dfrac{5}{2}$,

(b) express q in terms of p.

$$p = \sqrt{\frac{2-\left(-\frac{5}{2}\right)}{3+\left(-\frac{5}{2}\right)}}$$

(a) $= \sqrt{\dfrac{\frac{9}{2}}{\frac{1}{2}}}$ [M1]

$= 3$ [A1]

$$p = \sqrt{\frac{2-q}{3+q}}$$

$$p^2 = \frac{2-q}{3+q} \quad \text{[M1]}$$

$$p^2(3+q) = 2-q$$

(b) $3p^2 + p^2q = 2-q$

$p^2q + q = 2 - 3p^2$ [M1]

$q(p^2+1) = 2-3p^2$

$$q = \frac{2-3p^2}{p^2+1} \quad \text{[A1]}$$

Answer (a) $p =$ ..... [2]

(b) $q =$ ..... [3]

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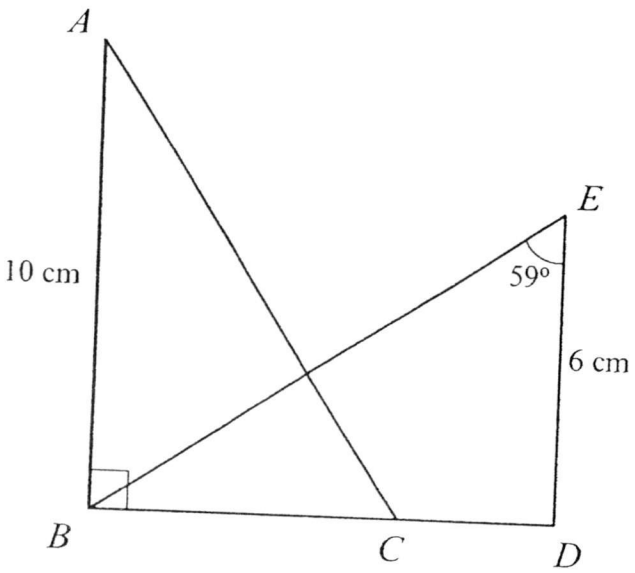
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13 In the figure below, ΔABC is congruent to ΔBDE, amd $\angle ABC = 90^\circ$, $\angle BED = 50^\circ$, $AB = 10$ cm and $DE = 6$ cm.

Find

(a) $\angle BAC$, .

(b) the length of CD.



(a) $\angle DBE = 180^\circ - 90^\circ - 59^\circ$ ($\angle$ sum of Δ)

$= 31^\circ$ [M1]

$\angle BAC = \angle DBE = 31^\circ$ [A1]

(b) ΔABC is congruent to ΔBDE (given).

$BD = AB = 10$ cm

$BC = DE = 6$ cm [M1]

$CD = BD - BC$

$= 10 - 6$

$= 4$ cm [A1]

Answer (a) $\angle BAC$ = ... [2]

(b) CD = ... cm [2]

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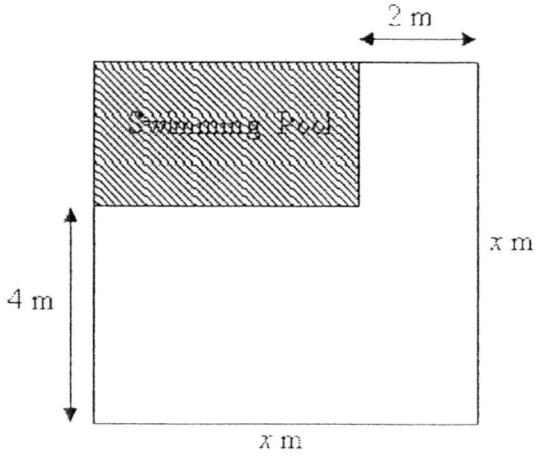
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(a) Write down an expression, in terms of x, for the area of the swimming pool.

(b) The area of the swimming pool was found to be 80 m^2.

Show that $x^2 - 6x - 72 = 0$.

(c) Hence, find the value of x.



(a)
$$\text{Area} = (x-2)(x-4)$$
$$= x^2 - 6x + 8 \qquad [B1]$$

(b)
$$x^2 - 6x + 8 = 80 \qquad [B1]$$
$$x^2 - 6x - 72 = 0$$

(c)
$$x^2 - 6x - 72 = 0$$
$$(x-12)(x+6) = 0 \qquad [M1]$$
$$x = 12 \text{ or } -6 \text{ (reject)}$$
$$= 12 \qquad [A1]$$

Note: Award 1 Answer mark only if they reject $x = -6$

Answer (a) Area = ... m^2 [1]

(b) Answer to be shown above [1]

(c) x = ... [2]

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ANSWER KEY

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BEATTY SECONDARY SCHOOL
MID-YEAR EXAMINATION 2015

SUBJECT : Mathematics

PAPER : 2

SETTER : Mrs Samsol

LEVEL : Sec 2 Express

DURATION : 1 hour 30 minutes

DATE : 18 May 2015

CLASS :	NAME :	REG NO :

READ THESE INSTRUCTIONS FIRST

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The number of marks is given in brackets [ ] at the end of each question or part question.
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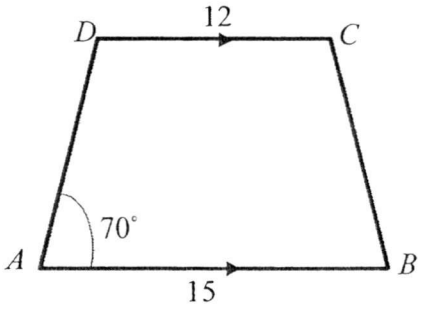
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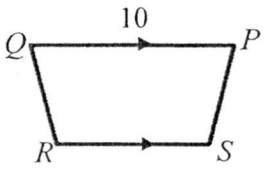
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1 Trapezium $ABCD$ is similar trapezium $PQRS$.
Given that $AB = 15$ cm, $DC = 12$ cm, $PQ = 10$ cm and $\angle DAB = 70^\circ$.





(a) Identify the side in trapezium $ABCD$ that corresponds to the side QR in trapezium $PQRS$. [1]

(b) Find

(i) $\angle PSR$, [1]

(ii) the length of RS. [2]

---

2 A park has an area of 6.4 km^2. It is represented by an area of 0.4 cm^2 on map A.

(a) Find the scale of the map in the form $1 : n$. [2]

(b) The length of a road on map A is 11 cm. Find its actual length in km. [1]

(c) Find the area, in cm^2, of the park drawn on map B whose scale is 1: 50 000. [2]

---

3 **(a)** Car A travels at a speed of $(4u^2 + 3u)$ km/h for 2.5 hours.
Car B travels at a speed of $(u^2 + 6u - 1)$ km/h for 2 hours.
Find an expression in terms of u, for the total distance travelled by cars A and B.
Simplify your answer. [3]

(b) Given the formula $P = \dfrac{5b - a}{2a + 1}$, make a the subject. [3]

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4 **(a)** It is given that $x = 3$ is a root of the equation $5x^2 + kx - 6 = 0$, where k is a constant.

(i) Find the value of k. [2]

(ii) Find the other root of the equation. [2]

(b) Express $\frac{x-1}{x^2-x-6} - \frac{2}{x+2}$ as a single fraction. [3]

---

5 **(a)** Factorise fully

(i) $36x^2 - 16$, [2]

(ii) $2pq - 8p - 20 + 5q$. [2]

(b) Given that $a^2 - b^2 = 24$ and $a + b = 8$, find the value of $3a - 3b$. [3]

---

6 **(a)** It is given that A is directly proportional to the cube of r.
Describe the change in the value of A when the value of r is doubled.
Show working to support your answer. [2]

(b) d is inversely proportional to x^n. The table below shows some values of x and the corresponding values of d.

x	1	2	5
d	40	10	a

Find the value of n and of a. [3]

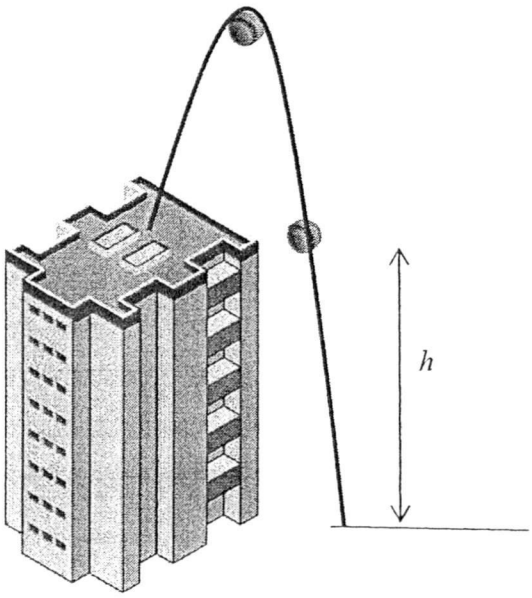
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7 **Answer the whole of this question on a sheet of graph paper.**

A ball is thrown from the top of a building.
Its vertical height h, in metres, above the ground at time t seconds during the flight is represented by the equation $h = 20 + 5t - t^2$.



Some corresponding values of t and h are given in the following table.

t	0	1	2	3	4	5	6	7
h	20	24	26	p	24	20	14	6

(a) Calculate the value of p. [1]

(b) Using a scale of 2 cm to represent 1 second, draw a horizontal t-axis for $0 \le t \le 8$.

Using a scale of 1 cm to represent 2 m, draw a vertical h-axis for $0 \le h \le 30$.

On your axes, plot the points given in the table and join them with a smooth curve. [3]

(c) Use your graph to estimate
(i) the maximum height of the ball from the ground, [1]
(ii) the time when the ball is 18 m above the ground. [1]

(d) Explain how you can use your graph to estimate the time when the ball hits the ground. [1]

(e) State the equation of the line of symmetry of the curve. [1]

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8 **(a)** Expand and simplify $3\left(\frac{1}{2}x+5\right)^2-2\left(\frac{1}{3}x-2\right)$. [3]

(b) Simplify

(i) $\frac{5a^3b}{9b^2c}\div\frac{10a}{3b}$, [2]

(ii) $\frac{2pq+3q}{q^2}\times\frac{2p^2-p-3}{4p^2-9}$. [3]

~ End of Paper ~

15

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Answer Key

1(a) BC

1(b)(i) 110° (ii) 8 cm

2(a) 1 : 400 000 (b) 44 km (c) 25.6 cm^2

3(a) $(12u^2 + 19.5u - 2)$ km (b) $a = \dfrac{5b - P}{2P + 1}$

4(a)(i) $k = -13$ (ii) $x = -\dfrac{2}{5}$

(b) $\dfrac{5 - x}{(x - 3)(x + 2)}$

5(a)(i) $4(3x + 2)(3x - 2)$ (ii) $(q - 4)(2p + 5)$

(b) 9

6(a) A increases by 8 times of the original value.
(b) 1.6

7(a) 26 (c)(i) 26.1 to 26.3 (ii) 5.3 to 5.5 (d) 7.5 to 7.7 (e) $x = 2.5$

8(a) $\dfrac{3}{4}x^2 + \dfrac{43}{3}x + 79$

(b)(i) $\dfrac{a^2}{6c}$

(ii) $\dfrac{p + 1}{q}$

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Mid-Year Exam 2015
Mathematics / Paper 2
Sec 2 Express
Setter : Mrs Samsol

Mark Scheme

Deduct 1 mark overall for no units given for 1(b)(i), 3(a) , 7(c)(i),7(c)(ii)

No	Workings	Marks	Remarks
1(a)	BC	B1	B0 if CB is given
1(b)(i)	$\angle PSR = \angle ADC = 180^\circ - 70^\circ$ (int $\angle$s) $= 110^\circ$	B1	**B0 if sum of quad is used.** **B0 if incorrect corresponding angle is stated even if answer given is 110^0**
1(b)(ii)	$\frac{RS}{CD} = \frac{PQ}{AB}$ $\frac{RS}{12} = \frac{10}{15}$ $RS = \frac{10}{15} \times 12$ $= 8$ cm	M1 A1	
2(a)	$0.4\ cm^2 : 6.4\ km^2$ $1\ cm^2 : 16\ km^2$ 1 cm : 4 km 1 cm : 400 000 cm 1 : 400 000	M1 A1	
2(b)	Actual length = 11 x 4 = 44 km	B1	B0 if no units or wrong units
2(c)	Map B : 1 cm : 50 000 cm 1 cm : 0.5 km $1\ cm^2 : 0.25\ km^2$ Map area = $\frac{6.4}{0.25}$ $= 25.6\ cm^2$	M1 A1	A0 if no units or wrong units

16 1

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3(a)	Total distance $= 2.5(4u^2 + 3u) + 2(u^2 + 6u - 1)$ $= 10u^2 + 7.5u + 2u^2 + 12u - 2$ $= (12u^2 + 19.5u - 2)$ km	M1 M1 A1	
3(b)	$P = \dfrac{5b - a}{2a + 1}$ $P(2a + 1) = 5b - a$ $2aP + P = 5b - a$ $2aP + a = 5b - P$ $a(2P + 1) = 5b - P$ $a = \dfrac{5b - P}{2P + 1}$	M1 M1 (factorisation) A1	
4(a)(i)	$5(3)^2 + 3k - 6 = 0$ $3k = -39$ $k = -13$	M1 A1	
4(a)(ii)	$5x^2 - 13x - 6 = 0$ $(5x + 2)(x - 3) = 0$ $x = -\dfrac{2}{5}$ or $x = 3$ (reject)	M1 A1	If $k = 13$, give M1√ for correct factorisation
4(b)	$\dfrac{x-1}{x^2 - x - 6} - \dfrac{2}{x+2}$ $= \dfrac{x-1}{(x-3)(x+2)} - \dfrac{2}{x+2}$ $= \dfrac{x-1}{(x-3)(x+2)} - \dfrac{2(x-3)}{x+2}$ $= \dfrac{x - 1 - 2x + 6}{(x-3)(x+2)}$ $= \dfrac{5 - x}{(x-3)(x+2)}$	M1 (factorise) M1 (Correct expansion) A1	

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5(a)(i)	$36x^2 - 16$ $= 4(9x^2 - 4)$ $= 4(3x + 2)(3x - 2)$	M1 A1	
5(a)(ii)	$2pq - 8p - 20 + 5q$ $= 2p(q - 4) - 5(4 - q)$ $= 2p(q - 4) + 5(q - 4)$ $= (q - 4)(2p + 5)$	M1 A1	Rearranging may be done at the first step : $2pq - 8p + 5q - 20$ $= 2p(q - 4) + 5(q - 4)$ M1 Give M0 if $2p(q - 4)[-5(4 - q)]$ is seen
5(b)	$a^2 - b^2 = 24$ $(a + b)(a - b) = 24$ $8(a - b) = 24$ $a - b = 3$ $3a - 3b = 3(a - b)$ $= 3(3)$ $= 9$	M1 M1 A1	
6(a)	Let A=k r^3 A=k $(2r)^3$ A=8kr^3 A is 8 times of the original value. or A increases by 700% or increases by 7 times .	M1 A1	
6(b)	Let d = $d = \frac{k}{x^n}$ $40 = \frac{k}{1}$ $k = 40$ Sub $x = 2$ and $d = 10$ $10 = \frac{40}{2^n}$ $2^n = 4 = 2^2$ $n = 2$ $a = \frac{40}{5^2} = \frac{8}{5}$ or 1.6	B1 B1 B1	

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7(a)	$p = 26$	B1	
7(b)	Refer to graph	G1:Correct scale and **correct label of both axes** G1:All points plotted correctly G1:Smooth curve	
7(c)(i)	26.25 m (Accept 26.1 to 26.5)	B1	
7(c)(ii)	5.4 s (Accept 5.3 to 5.5)	B1	
7(d)	Extend the graph until it meets the t-axis. The t-value is the time required.	B1	
7(e)	$t = 2.5$	B1	
8(a)	$3\left(\frac{1}{2}x+5\right)^2 - 2\left(\frac{1}{3}x-2\right)$ $= 3\left(\frac{1}{4}x^2+5x+25\right)-\frac{2}{3}x+4$ $=\frac{3}{4}x^2+15x+75-\frac{2}{3}x+4$ $=\frac{3}{4}x^2+\frac{43}{3}x+79$	M1 M1 A1	
8(b)(i)	$\frac{5a^3b}{9b^2c}\div\frac{10a}{3b}$ $=\frac{5a^3b}{9b^2c}\times\frac{3b}{10a}$ $=\frac{a^2}{6c}$	M1 A1	
8(b)(ii)	$\frac{2pq+3q}{q^2}\times\frac{2p^2-p-3}{4p^2-9}$ $=\frac{q(2p+3)}{q^2}\times\frac{(2p-3)(p+1)}{(2p+3)(2p-3)}$ $=\frac{p+1}{q}$	M1 (factorization of numerator) M1 (factorization of numerator) A1	

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