BEATTYSECONDARY SCHOOL
MID-YEAR EXAMINATION 2014

SUBJECT : Mathematics **LEVEL : Sec 2 Express**

PAPER : 1 **DURATION : 1 hour 15 minutes**

SETTER : Mrs Rose Ang **DATE :16May 2014**

CLASS :	NAME :	REG NO :

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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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1 Expand and simplify

(a) $(2x-5)(x^2+5)$

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

Answer : (a) _____ [1]

(b) _____ [2]

2 Factorise **completely**.

(a) $3x^2+7x-6$

(b) $162-128y^2$

(c) $1-a^2-ab-b$

Answer : (a) _____ [2]

(b) _____ [2]

(c) _____ [2]

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3 Simplify each of the following.

(a) $\dfrac{5a^2b \times 6(ab)^2}{15ab^2}$

(b) $\dfrac{3x+9}{x+1} \div \dfrac{(x+3)^2}{x^2+4x+3}$

(c) $\dfrac{1}{x-1} + \dfrac{x-1}{1-x^2}$

Answer : **(a)** _____ **[1]**

(b) _____ **[2]**

(c) _____ **[3]**

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4 Solve each of the following equations.

(a) $(2x+1)(x-3)=0$

(b) $(x+2)^2-2x=7$

Answer : (a) _____ [1]

(b) _____ [3]

5 Solve the simultaneous equations.

$$2x+3y=-2.5$$
$$3x-4y+25=0$$

Answer : $x=$ _____ , $y=$ _____ [3]

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6 **(a)** Make s the subject of the formula $\frac{1}{r}+\frac{1}{s}=\frac{1}{t}$.

(b) Given that $\sqrt{a^2+b}=c+1$,

(i) express a in terms of b and c.

(ii) **Hence,** find the **exact**value of a when $b=-5$ and $c=3$.

Answer : **(a)** _____ **[3]**

(bi) _____ **[2]**

(bii) _____ **[1]**

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7 A map is drawn to a scale of 1 : 5000.

(a) A rectangular car park has a length of 10.5 cm on the map. Find the actual length of the car park in metres.

(b) A circular pond has an actual area of 1 500π square metres. Find the area of this circular pond on the map, giving your answer in terms of π.

Answer : (a) _____ m [2]

(b) _____ cm^2 [3]

8 Rachel threw a ball upwards from the ground.
Given that the height of the ball, $h$metres, from the ground after t seconds is given by the equation $h = 30t - 6t^2$, find the time taken for the ball to hit the ground.

Answer : _____ s [3]

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9 p is inversely proportional to the cube of q.

(a) Given that when $p = 5$, $q = 2$, express p in an equation in terms of q.

(b) It is known that $p = \theta$ for a particular value of q.

Find the value of p in terms of θ, when this value of q is halved.

Answer : **(a)** _____ **[2]**

(b) _____ **[2]**

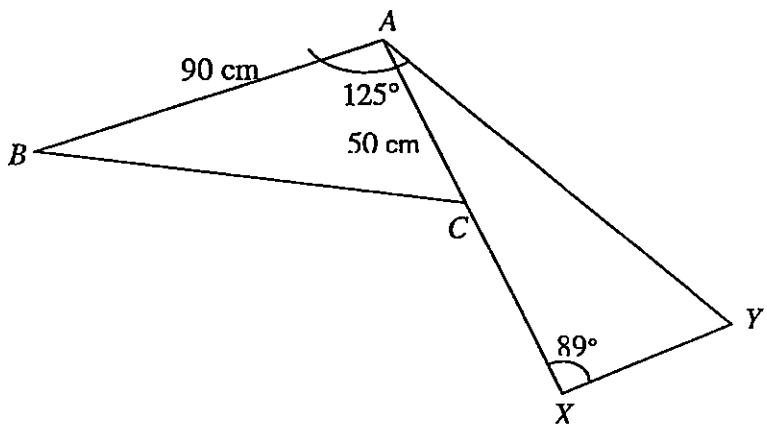
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10 In the figure below, $\Delta ABC \equiv \Delta XAY$, $AB = 90$ cm, $AC = 50$ cm, $\angle AXY = 89^\circ$ and $\angle BAY = 125^\circ$.



(a) Write down the length of XY.

(b) Find $\angle XAY$, stating your reason clearly.

(c) Find $AC : CX$.

Answer : **(a)** _____ cm **[1]**

(b) _____ ° **[2]**

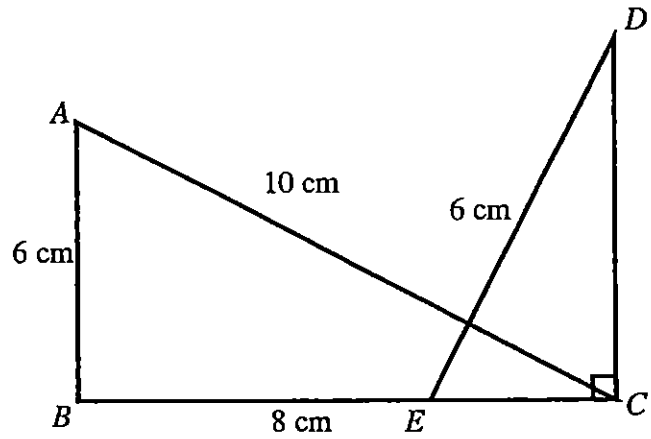
(c) _____ **[2]**

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11 In the figure below, ΔBAC is similar to ΔCED.
Given that $AC = 10$ cm, $DE = 6$ cm, $AB = 6$ cm and $\angle DCE = 90°$. Find



(a) Find $\angle ABC$.

(b) Calculate

(i) the length of EC,
(ii) the area of ΔCED.

Answer : **(a)** _____ ° **[1]**

(bi) _____ cm **[2]**

(bii) _____ cm^2 **[2]**

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Answer Key

1a	$2x^3-5x^2+10x-25$	1b	$3x^2-18xy+27y^2$		
2a	$(3x-2)(x+3)$	2b	$2(9+8y)(9-8y)$	2c	$(a+1)(1-a-b)$
3a	$2a^3b$	3b	3	3c	$\dfrac{2}{(x+1)(x-1)}$
4a	$x=-\dfrac{1}{2}$ or $x=3$	4b	$x=-3$ or $x=1$		
5	$x=-5,\ y=2.5$				
6a	$s=\dfrac{rt}{r-t}$	6bi	$a=\pm\sqrt{(c+1)^2-b}$	6bii	$a=\pm\sqrt{21}$
7a	525 m	7b	$\dfrac{3\pi}{5}\text{cm}^2$		
8	$t=5$	9a	$p=\dfrac{40}{q^3}$	9b	$p=8\theta$
10a	50 cm	10b	$\angle XAY=125°-89°=36°$	10c	5 : 4
11a	90°	11bi	3.6 cm	11bii	8.64 cm^2

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Marking Scheme

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

(a) $(2x-5)(x^2+5)$
$= 2x^3-5x^2+10x-25$ [B1]

(b) $3(x-3y)^2$
$=3(x^2-6xy+9y^2)$ or $(3x-9y)(x-3y)$ [M1]
$= 3x^2-18xy+27y^2$ [A1]

Answer : **(a)** _____ **[1]**

(b) _____ **[2]**

2 Factorise **completely**.

(a) $3x^2+7x-6$
(b) $162-128y^2$
(c) $1-a^2-ab-b$

(a) $3x^2+7x-6$
$=(3x-2)(x+3)$ [M1, A1] or [A2]

(b) $162-128y^2$
$= 2(81-64y^2)$ [M1]
$= 2(9+8y)(9-8y)$ [A1]

(c) $1-a^2-ab-b$
$=(1+a)(1-a)-b(a+1)$ [M1]
$= (a+1)(1-a-b)$ [A1]

Answer : **(a)** _____ **[2]**

(b) _____ **[2]**

(c) _____ **[2]**

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3 Simplify each of the following.

(a) $\dfrac{5a^2b\times 6(ab)^2}{15ab^2}$

(b) $\dfrac{3x+9}{x+1}\div\dfrac{(x+3)^2}{x^2+4x+3}$

(c) $\dfrac{1}{x-1}+\dfrac{x-1}{1-x^2}$

(a) $\dfrac{5a^2b\times 6(ab)^2}{15ab^2}=2a^3b$ [B1]

(b) $\dfrac{3x+9}{x+1}\div\dfrac{(x+3)^2}{x^2+4x+3}$

$=\dfrac{3(x+3)}{x+1}\times\dfrac{(x+3)(x+1)}{(x+3)^2}$ [M1]

$= 3$ [A1]

(c) $\dfrac{1}{x-1}+\dfrac{x-1}{(1+x)(1-x)}$

$=\dfrac{1}{x-1}-\dfrac{x-1}{(1+x)(x-1)}$ [M1- change of sign]

$=\dfrac{x+1-x+1}{(x+1)(x-1)}$ [M1-common denominator]

$=\dfrac{2}{(x+1)(x-1)}$ [A1]

Answer : **(a)** _____ **[1]**

(b) _____ **[2]**

(c) _____ **[3]**

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4 Solve each of the following equations.

(a) $(2x+1)(x-3)=0$

(b) $(x+2)^2-2x=7$

(a) $x=-\frac{1}{2}$ or $x=3$ [B1]

(b) $(x+2)^2-2x=7$

$x^2+2x-3=0$ [M1]

$(x+3)(x-1)=0$ [M1]

$x=-3$ or $x=1$ [A1]

Answer : **(a)** _____ **[1]**

(b) _____ **[3]**

5 Solve the simultaneous equations.

$$2x+3y=-2.5$$
$$3x-4y+25=0$$

$2x+3y=-2.5$ ---------- (1)

$3x-4y=-25$ ---------- (2)

(1) × 3, $6x+9y=-7.5$ ------- (3)

(2) × 2, $6x-8y=-50$ -------- (4)

(3) − (4), $17y=42.5$

$y=2.5$

Sub $y=-2.5$ into (1),

$2x+3(2.5)=-2.5$

$x=-5$

Answer : $x=$ _____ , $y=$ _____ **[3]**

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6 **(a)** Make s the subject of the formula $\frac{1}{r}+\frac{1}{s}=\frac{1}{t}$.

(b) Given that $\sqrt{a^2+b}=c+1$,

(i) express a in terms of b and c.
(ii) **Hence**, find the **exact**value of a when $b=-5$ and $c=3$.

(a) $\frac{1}{r}+\frac{1}{s}=\frac{1}{t}$

$\frac{1}{s}=\frac{1}{t}-\frac{1}{r}$ [M1]

$\frac{1}{s}=\frac{r-t}{rt}$ [M1]

$s=\frac{rt}{r-t}$ [A1]

(b) (i) $\sqrt{a^2+b}=c+1$

$a^2+b=(c+1)^2$ [M1]

$a^2=(c+1)^2-b$

$a=\pm\sqrt{(c+1)^2-b}$ [A1]

(ii) $a=\pm\sqrt{(3+1)^2+5}=\pm\sqrt{21}$ [B1]

Answer : **(a)** _____ **[3]**

(bi) _____ **[2]**

(bii) _____ **[1]**

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(a) A rectangular car park has a length of 10.5 cm on the map. Find the actual length of the car park in metres.

(b) A circular pond has an actual area of $1\,500\pi$ square metres. Find the area of this circular pond on the map, giving your answer in terms of π.

(a) 1 cm ---------- 5 000 cm
1 cm ---------- 50 m [M1]
10.5 cm ------- 525 m [A1]

(b) 1 cm^2 ---------- $2\,500\text{ m}^2$ [M1]

$\frac{\pi \times 1500}{2500}\text{cm}^2$ ---------- $1\,500\pi\text{ m}^2$ [M1]

$= \frac{3\pi}{5}\text{cm}^2$ [A1]

Answer : **(a)** _____ m **[2]**

(b) _____ cm^2 **[3]**

8 Rachel threw a ball upwards from the ground.
Given that the height of the ball, *h* metres, from the ground after *t* seconds is given by the equation $h = 30t - 6t^2$, find the time taken for the ball to hit the ground.

$h = 6t(5-t) = 0$ [M1]

$t = 0$ (rej) or $t = 5$ [M1]

$t = 5$ [A1]

Answer : _____ s **[3]**

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9 p is inversely proportional to the cube of q.

(a) Given that when $p = 5$, $q = 2$, express p in an equation in terms of q.

(b) It is known that $p = \theta$ for a particular value of q. Find the value of p in terms of θ, when this value of q is halved.

(a) $p = \dfrac{k}{q^3}$

$5 = \dfrac{k}{2^3} \Rightarrow k = 40$ [M1]

$p = \dfrac{40}{q^3}$ [A1]

(b) When $q = a, p = \theta \Rightarrow \theta = \dfrac{40}{a^3}$

When $q = \dfrac{1}{2}a$, $p = \dfrac{40}{\left(\frac{1}{2}a\right)^3}$ [M1]

$p = 8\left(\dfrac{40}{a^3}\right) = 8\theta$ [A1]

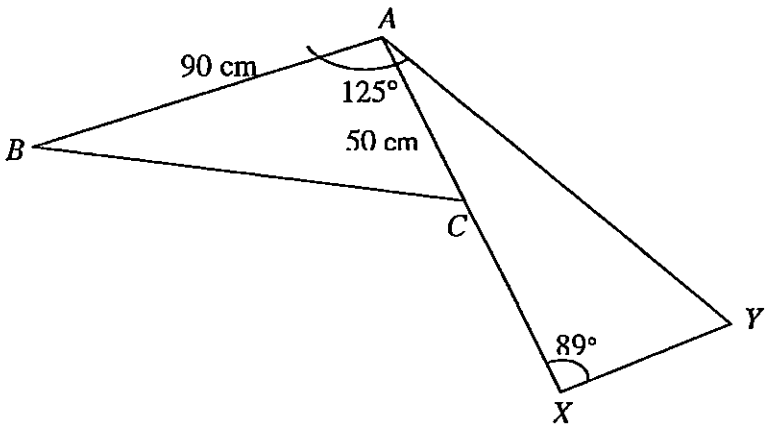
Answer : **(a)** _____ **[2]**

(b) _____ **[2]**

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10 In the figure below, $\Delta ABC \equiv \Delta XAY$, $AB = 90$ cm, $AC = 50$ cm, $\angle AXY = 89^\circ$ and $\angle BAY = 125^\circ$



(a) Write down the length of XY.

(b) Find $\angle XAY$, stating your reason clearly.

(c) Find $AC : CX$.

(a) $XY = 50$ cm [B1]

(b) $\angle BAC = \angle AXY = 50^\circ$ [M1]
$\angle XAY = 125° - 50° = 75°$ [A1]

(c) $AX = AB = 90$ cm [M1]
$CX = 90 - 50 = 40$ cm
$AC : CX = 5 : 4$ [A1]

Answer : **(a)** _____ *cm* **[1]**

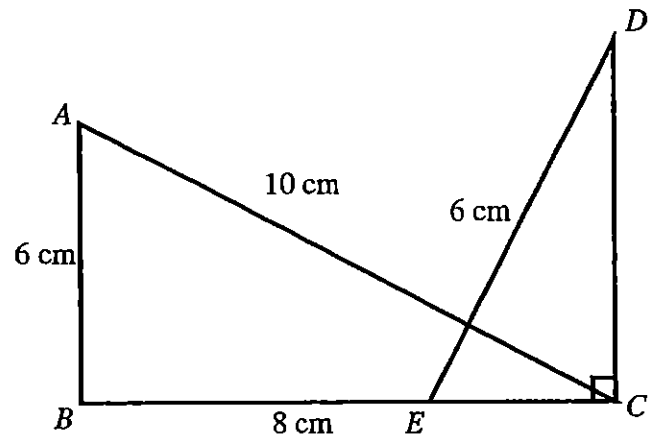
(b) _____ **[2]**

(c) _____ **[2]**

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Given that $AC = 10$ cm, $DE = 6$ cm, $AB = 6$ cm and $\angle DCE = 90°$. Find



(a) Find $\angle ABC$.

(b) Calculate
(i) the length of EC,
(ii) the area of ΔCED.

(a) $\angle ABC = 90°$ [B1]

(b) (i) $\frac{EC}{AB} = \frac{DE}{AC}$

$\frac{EC}{6} = \frac{6}{10}$ [M1]

$EC = 3.6$ cm [A1]

(ii) $\frac{DC}{8} = \frac{6}{10}$ [M1]

$DC = 4.8$ cm

Area of $\Delta CED = \frac{1}{2} \times 3.6 \times 4.8 = 8.64$ cm^2 [A1]

Answer : **(a)** _____ ° **[1]**

(bi) _____ cm **[2]**

(bii) _____ cm^2 **[2]**

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BEATTY SECONDARY SCHOOL
MID-YEAREXAMINATION 2014

SUBJECT : Mathematics **LEVEL : Sec 2Express**

PAPER : 2 **DURATION : 1 hour 30 minutes**

SETTER : MrsKajen **DATE : 19May 2014**

CLASS :	NAME :	REG NO :

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1. The area of a reservoir is 180000 m^2. It is represented on a map by an area of 2 cm^2.

(a) Express the scale in the form $1 : n$. [2]

(b) Given that the shoreline of the reservoir is 5.4 km. What is the shoreline on the map? [2]

2. **(a)** Two quantities, y and x^2, are in inverse proportion.

If the difference in the values of y when $x = 5$ and when $x = 10$ is 1.2, find

(i) an equation connecting x and y, [2]

(ii) the value of y when $x = -2$. [1]

(b) Two quantities, $p$and $\sqrt{q}$, are in direct proportion. When q is increased by $h\%$, the percentage increase in p is 200%. Find the value of h. [2]

3. Expand and simplify the following.

(a) $(3x - 5)(3x + 5)$ [1]

(b) $(3 - y)(7 + 4y)$ [2]

4. Factorise the following completely.

(a) $12x^3y - 18x^2y^2 + 6xy^3$ [2]

(b) $16 - (c + 2d)^2$ [2]

5. **(a)** Factorise $2x^2 + 13x + 15$ [1]

(b) **Hence**, write down the factors of 21315. [2]

6. Given $y = \dfrac{6x - 2z}{3z - x}$

(a) If $z = -3$ and $y = 2$, find x. [2]

(b) Express z in terms of $y$and x. [2]

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7. Simplifythe following.

(a) $\dfrac{3}{4x+2} - \dfrac{x}{2x^2-3x-2}$ [3]

(b) $\left[\dfrac{x-6}{x^2-x-6} - 1\right] \div \dfrac{x^2}{4-x^2}$ [3]

8. It is given that $x = 5$ is a root of the equation $4x^2 + kx - 15 = 0$, where k is a constant. Find,

(a) the value of k , [2]

(b) the other root of the equation. [2]

9. The area of a rectangle is four times the area of a square of side $(x + 1)$ cm. The length and breadth of the rectangle are $(3x + 5)$ cm and $(3x - 1)$ cm respectively.

(a) Form an equation in x and show that it reduces to$5x^2 + 4x - 9 = 0$. [2]

(b) Solve the equation. [2]

(c) Hence find the area of the rectangle. [2]

10. The radius of a small circle is $(p - 2q)$ cm and the radius of a big circle is $(5p - 12q)$cm. The radius of the big circle is twice the radius of the small circle.

(a) Write down and simplify a linear equation connecting p and q. [1]

(b) If the sum of the circumference of the two circle is 16 π cm. [2]

Write down and simplify another linear equation connecting p and q.

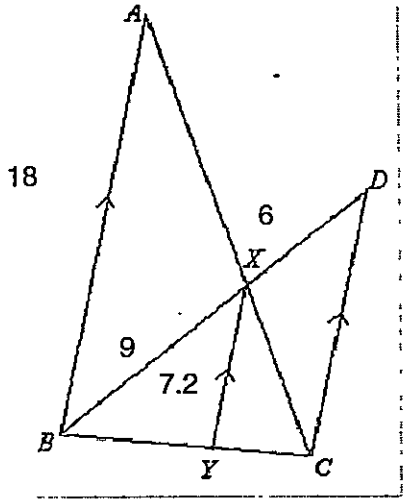
(c) (i) Find the values of p and q. [3]

(ii) Hence, find the radii of the small circle. [1]

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11. In the diagram below, AB, DC and XY are parallel to each other. AC and BD meet at X.

It is given that triangle ABX is similar to triangle CDX.



Given that $AB = 18$ cm, $DX = 6$ cm, $XB = 9$ cm and $XY = 7.2$ cm, find

(a) the length of CD, [2]

(b) $\dfrac{\text{Area of } \Delta CXY}{\text{Area of trapezium } XABY}$ [2]

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Answers

1a	30 000 cm	6a	-3
1b	18 cm	6b	$z = \frac{x(6+y)}{3y+2}$
2a	(i) $y = \frac{40}{x^2}$	7a	$\frac{x-6}{2(2x+1)(x-2)}$
	(ii) 10	7b	$= \left[\frac{(2-x)^2}{x(x-3)}\right]$
2b	800		
		8a	$k = -17$
3a	$9x^2 - 25$	8b	$x = -\frac{3}{4}$
3b	$21 + 5y - 4y^2$		
		9b	$x = -\frac{9}{5}$ *or* $x = 1$
4a	$6xy(2x - y)(x - y)$	9c	16 cm^2
4b	$[4 - (c - 2d)][4 + (c - 2d)]$		
		10a	$3p - 8q = 0$
5a	$(2x + 3)(x + 5)$	10b	$3p - 7q = 4$ (2)
5b	21315 = (203) (105)	10c	(i) $p = 10\frac{2}{3}$ *and* $q = 4$
			(ii) $2\frac{2}{3}$
		11a	12cm
		11b	$\frac{4}{21}$

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	(a)	Express the scale in the form 1 : n.	[2]
	(b)	Given that the shoreline of the reservoir is 5.4 km. What is the shoreline on the map ?	[2]

	(a)	$2\ cm^2 = 180\ 000\ m^2$ $1cm^2 = 90\ 000\ m^2$ $1\ cm = \sqrt{90\ 000}$ [M1] $= 300\ m$ $= 30\ 000\ cm$ [A1]
	(b)	Shoreline on map $= \frac{5.4 \times 1000 \times 100}{30\ 000}$ [M1] $= 18\ cm$ [A1]

2.	**(a)**	Two quantities, y and x^2, are in inverse proportion. If the difference in the values of y when $x = 5$ and when $x = 10$ is 1.2, find		
		(i)	an equation connecting x and y, $y = \frac{k}{x^2}$ $\frac{k}{5^2} - \frac{k}{10^2} = 1.2$ [M1] $\frac{k}{25} - \frac{k}{100} = 1.2$ $\frac{4k - k}{100} = 1.2$ $\frac{3k}{100} = 1.2$ $3k = 120$ $k = 40$ $y = \frac{40}{x^2}$ [A1]	[2]
		(ii)	the value of y when $x = -2$. $y = \frac{40}{(-2)^2}$ $= 10$ [B1]	[1]

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	(b)	Two quantities, p and $\sqrt{q}$ are in direct proportion. When q is increased by $h\%$, the percentage increase in p is 200%. Find the value of h.	[2]

$p = k\sqrt{q}$

$3p = k\sqrt{\frac{100+h}{100}}q$ [M1]

$$3p = k\sqrt{q}\sqrt{\frac{100+h}{100}}$$

$3p = p\sqrt{\frac{100+h}{100}}$

$3 = \sqrt{\frac{100+h}{100}}$

$9 = \frac{100+h}{100}$

$$900 = 100 + h$$

$h = 900 - 100$

$= 800$ [A1]

3.	Expand and simplify the following.		
	(a)	$(3x-5)(3x+5)$ $= 9x^2 - 25$ [B1]	[1]
	(b)	$(3-y)(7+4y)$ $= 21 + 12y - 7y - 4y^2$ [M1] $= 21 + 5y - 4y^2$ [A1]	[2]

4.	Factorise the following completely.		
	(a)	$12x^3y - 18x^2y^2 + 6xy^3$ $= 6xy(2x^2 - 3xy + y^2)$[M1] $= 6xy(2x - y)(x - y)$[A1]	[2]
	(b)	$16 - (c-2d)^2$ $= 4^2 - (c-2d)^2$[M1]	[2]

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		$=[4-(c-2d)][4+(c-2d)]$[A1]	

5.	**(a)**	Factorise $2x^2+13x+15$ $=(2x+3)(x+5)$ [B1]	[1]
	(b)	**Hence**, write down the factors of 21315. $21315=2(10\,000)+13(100)+15$ [M1] $=[2(100)+3][100+5]$ $=(203)(105)$ [A1]	[2]

6.	Given $y=\frac{6x-2z}{3z-x}$		
	(a)	If $z=-3$ and $y=2$, find x. $y=\frac{6x-2z}{3z-x}$ $2=\frac{6x-2(-3)}{3(-3)-x}$ [M1] $2=\frac{6x+6}{-9-x}$ $2(-9-x)=6x+6$ $-18-6=6x+2x$ → $-18-2x=6x+6$ $-24=8x$ $x=\frac{-24}{8}$ $=-3$ [A1]	[2]
	(b)	Express z in terms of y and x. $y=\frac{6x-2z}{3z-x}$	[2]

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		$y(3z-x)=6x-2z$ $3yz-xy=6x-2z$ [M1] $3yz+2z=6x+xy$ $z(3y+2)=x(6+y)$ $z=\frac{x(6+y)}{3y+2}$ [A1]	

7.	Simplifythe following.		
	(a)	$\frac{3}{4x+2}-\frac{x}{2x^2-3x-2}$ $=\frac{3}{2(2x+1)}-\frac{x}{(2x+1)(x-2)}$[M1] $=\frac{3(x-2)-2x}{2(2x+1)(x-2)}$ [M1] $=\frac{3x-6-2x}{2(2x+1)(x-2)}$ $=\frac{x-6}{2(2x+1)(x-2)}$[A1]	[3]
	(b)	$=\left[\frac{x-6}{(x-3)(x+2)}-1\right]\div\frac{x^2}{4-x^2}$ [M1] $=\left[\frac{x-6-(x^2-x-6)}{(x-3)(x+2)}\right]\times\frac{4-x^2}{x^2}$ $=\left[\frac{x-6-x^2+x+6}{(x-3)(x+2)}\right]\times\frac{(2+x)(2-x)}{x^2}$ [M1] $=\left[\frac{2x-x^2}{(x-3)}\right]\times\frac{(2-x)}{x^2}$	[3]

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		$=\left[\frac{x(2-x)}{(x-3)}\right]\times\frac{2-x}{x^2}=\left[\frac{(2-x)^2}{x(x-3)}\right]$ [A1]	

8.	It is given that $x=5$ is a root of the equation $4x^2+kx-15=0$, where k is a constant. Find,		
	(a)	the value of k , $4x^2+kx-15=0$ $4(5^2)+k(5)-15=0$ [M1] $100-15+5k=0$ $85+5k=0$ $5k=-85$ $k=-17$ [A1]	[2]
	(b)	the other root of the equation. $4x^2-17x-15=0$ $(4x+3)(x-5)=0$ $(4x+3)=0$ *or* $(x-5)=0$ [M1] $4x=-3$ or $x=5$ $x=-\frac{3}{4}$ [A1]	[2]

9.	The area of a rectangle is four times the area of a square of side $(x+1)$ cm. The length and breadth of the rectangle are $(3x+5)$ cm and $(3x-1)$ cm respectively.		
	(a)	Form an equation in x and show that it reduces to$5x^2+4x-9=0$ $4(x+1)^2=(3x+5)(3x-1)$ [M1] $4(x^2+2x+1)=9x^2-3x+15x-5$ $4x^2+8x+4=9x^2+12x-5$ [M1] $5x^2+4x-9=0$ [proven]	[2]

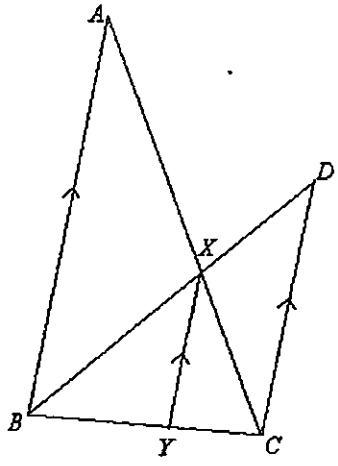
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	(b)	Solve the equation and find the area of the rectangle $5x^2 + 4x - 9 = 0$ $(5x + 9)(x - 1) = 0$ [M1] $(5x + 9) = 0 \; or \; (x - 1) = 0$ $5x = -9 \; or \; x = 1$ $x = -\frac{9}{5} or \; x = 1$ [A1]	[2]
	(c)	Find the area of the rectangle. Area of rectangle $=4(1 + 1)^2$ [M1] $=16$ cm^2 [A1]	[2]

10.	The radius of a small circle is $(p - 2q)$ cm and the radius of a big circle is $(5p - 12q)$cm. The radius of the big circle is twice the radius of the small circle.			
	(a)	Write down and simplify a linear equation connecting p and q. $2(p - 2q) = 5p - 12q$ $2p - 4q = 5p - 12q$ $3p - 8q = 0$ (1) [A1]		[1]
	(b)	If the sum of the circumference of the two circle is 16π cm. Write down the pair of simultaneous linear equations connecting p and q. $2\pi(p - 2q) + 2\pi(5p - 12q) = 16\pi$ $2\pi[(p - 2q) + (5p - 12q] = 2\pi(8)$ [M1] $p - 2q + 5p - 12q = 8$ $6p - 14q = 8$ $3p - 7q = 4$ (2) [A1]		[2]
	(c)	(i)	Find the values of$p$and q. Eqn (1) –Eqn (2) $-8q - (-7q) = 0 - 4$ [M1]	[3]

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			$-q = -4$ $q = 4$ Substitute $q = 4$ into equation 1 [M1] $3p - 8(4) = 0$ $3p - 32 = 0$ $3p = 32$ $p = \frac{32}{3}$ $p = 10\frac{2}{3}$ [A1]	
		(ii)	Hence, find the radii of the small circle. Radius of small circle $= p - 2q$ $= 10\frac{2}{3} - 2(4)$ $= 2\frac{2}{3}$ [B1]	[1]

11.	In the diagram, AB, DC and XY are parallel to each other. AC and BD meet at X. It is given that ΔABX is similar to ΔCDX .  	
	Given that $AB = 18$ cm, $DX = 6$ cm, $XB = 9$ cm and $XY = 7.2$ cm, find	

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	(a)	the length of CD, $\frac{AB}{CD} = \frac{BX}{DX}$ $\frac{18}{CD} = \frac{9}{6}$ [M1] $18 \times 6 = 9 \times CD$ $CD = 12$ [A1]	[2]
	(b)	$\frac{\text{Area of } \Delta CXY}{\text{Area of trapezium } XABY}$ $= \frac{7.2^2}{18^2 - 7.2^2}$ [M1] $= \frac{4}{21}$ [A1] **Or** $\frac{\text{Area of } \Delta CXY}{\text{Area of } \Delta CAB} = \left(\frac{7.2}{18}\right)^2$ $\frac{\text{Area of } \Delta CXY}{\text{Area of } \Delta CAB} = \left(\frac{4}{25}\right)$ [M1] $\frac{\text{Area of } \Delta CXY}{\text{Area of } XABY} = \frac{4}{25-4}$ {A1]	[2]

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