ADDITIONAL MATHEMATICS

0606 P1

2017 - 2023
QUESTIONS+ANSWERS

CAMBRIDGE IGCSE
2017 - 2023

TOPICAL PAST PAPERS

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ADDITIONAL MATHEMATICS
0606   P1

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TOPICAL PAST PAPER WORKSHEETS

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471 Questions

P2
478 Questions

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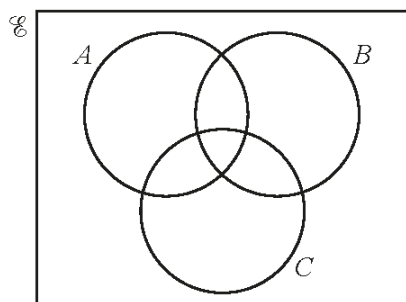**1** - (0606/12_Summer_2017_Q1) - *Sets*

On each of the Venn diagrams below, shade the region which represents the given set.
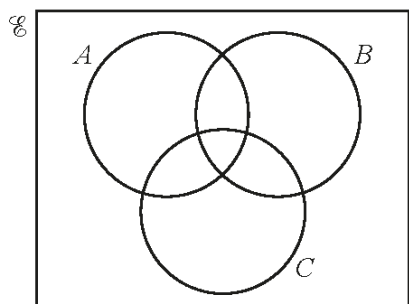
$(A \cup B) \cap C$
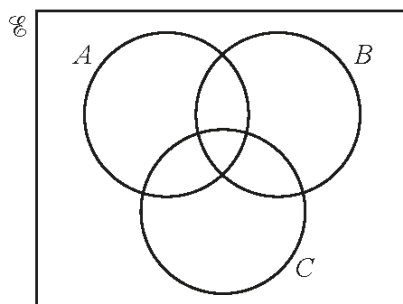
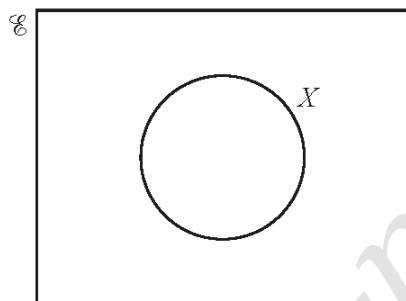$(A \cap B) \cup C$
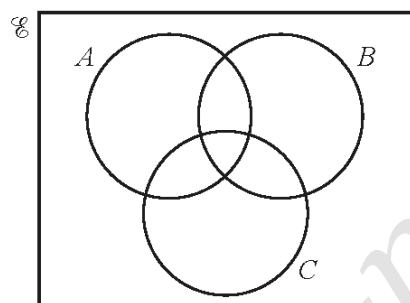
$(A' \cap B') \cap C$

[3]

2 ▪ (0606/13_Summer_2017_Q1) ▪ *Sets*

(a) On the Venn diagram below, shade the region which represents $(A \cap B') \cup (C \cap B')$. [1]
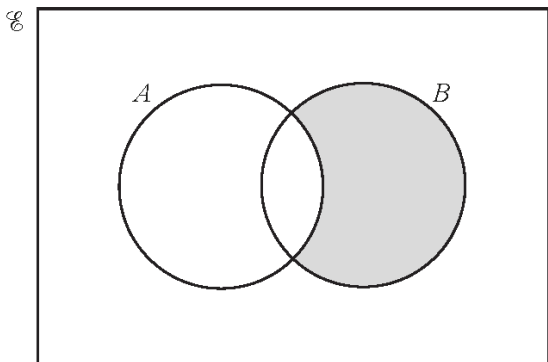

(b) Complete the Venn diagram below to show the sets Y and Z such that $Z \subset X \subset Y$. [1]

3 - (0606/11_Winter_2017_Q1) - *Sets*
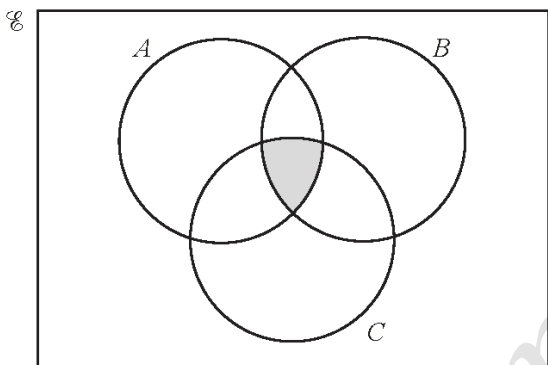
Express in set notation the shaded regions shown in the Venn diagrams below.

(i)

.... [1]

(ii)

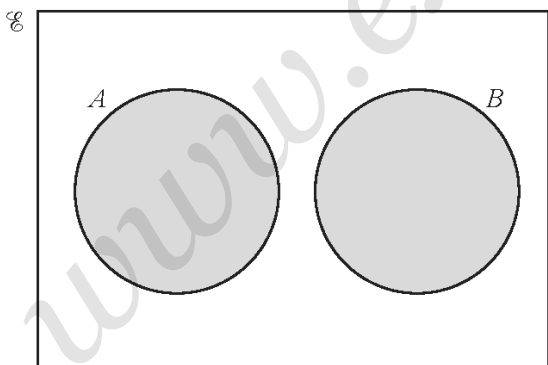..................................... [1]

(iii)

.... [1]
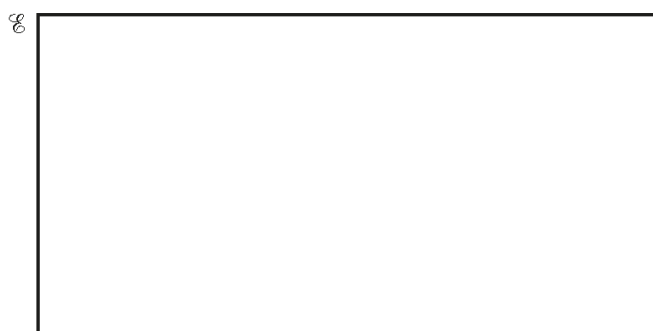
4 - (0606/12_Winter_2017_Q1) - *Sets*

(i) On the Venn diagram below, draw sets X and Y such that $n(X \cap Y) = 0$.

$\mathscr{E}$

[1]

(ii) On the Venn diagram below, draw sets A, B and C such that $C \subset (A \cup B)'$.
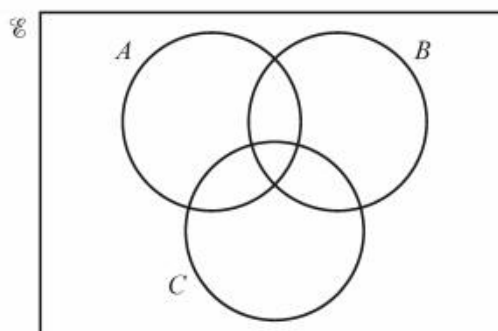
$\mathscr{E}$

[2]

5 - (0606/11_Summer_2019_Q1) - *Sets*

(a) On the Venn diagrams below, shade the region indicated.
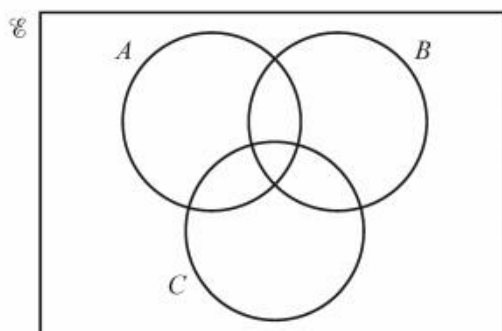
$(A \cap B) \cup C$

$(A' \cup B) \cap C$

[2]

(b) On the Venn diagram below, draw sets P, Q and R such that
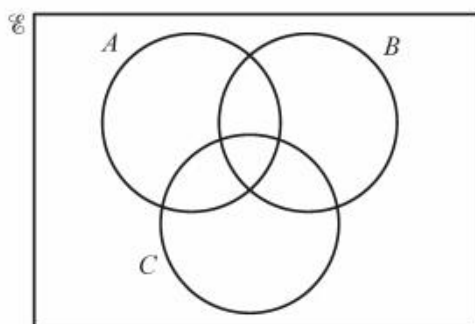
$$P \subset R, \ Q \subset R \ \text{ and } \ P \cap Q = \varnothing.$$

[2]

6 - (0606/12_Summer_2019_Q1) - *Sets*

(a) On the Venn diagrams below, shade the region indicated.

$A' \cap B' \cap C'$
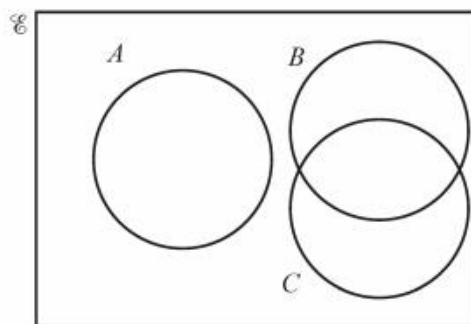
$A \cup (B \cap C)$

[2]

(b)

$$\mathscr{E} = \{x : 0° \leqslant x \leqslant 360°\}$$

$$P = \{x : \cos 2x = 0.5\}$$

$$Q = \{x : \sin x = 0.5\}$$

Find $P \cap Q$.

[3]

7 - (0606/13_Summer_2019_Q1) - *Sets*

Describe, using set notation, the relationship between the sets shown in each of the Venn diagrams below.

....
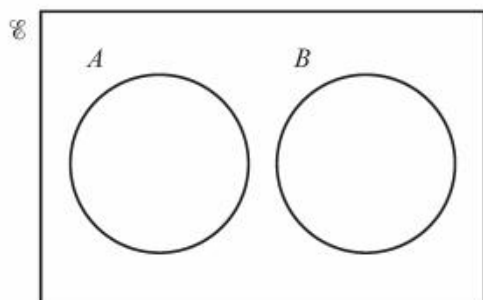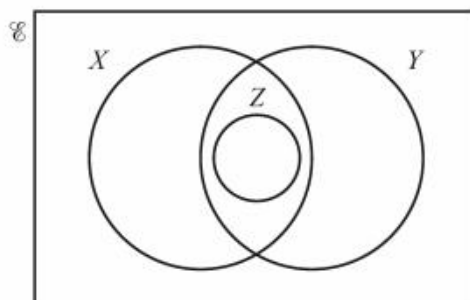
[3]

8 - (0606/11_Winter_2019_Q1) - *Sets*

Using set notation, describe the regions shaded on the Venn diagrams below.

.... [2]

9 ₌ (0606/13_Winter_2019_Q1) ₌ *Sets*
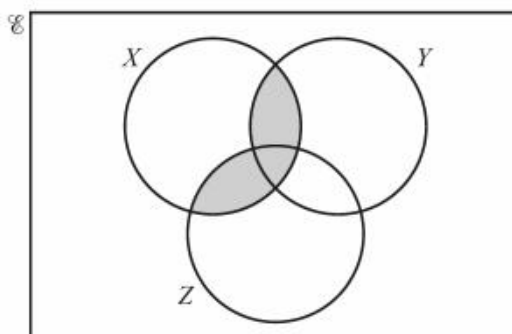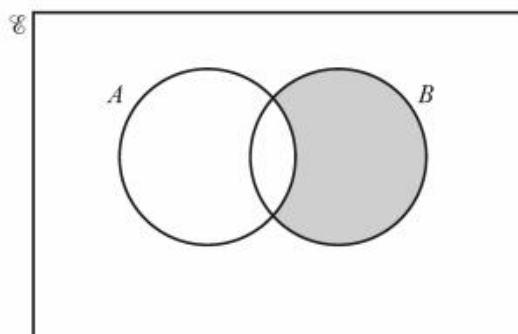
In a group of 145 students, the numbers studying mathematics, physics and chemistry are given below. All students study at least one of the three subjects.

        x students study all 3 subjects

        24 students study both mathematics and chemistry

        23 students study both physics and chemistry

        28 students study both mathematics and physics
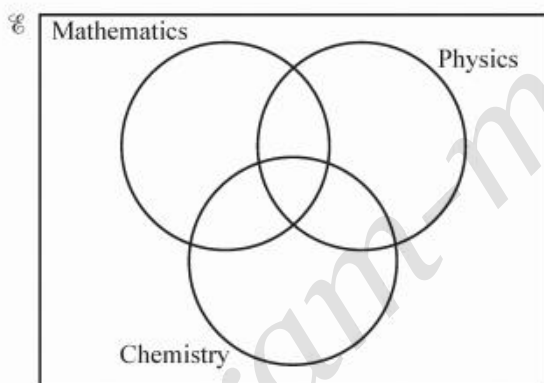
        50 students study chemistry

        75 students study physics

        80 students study mathematics

(i)   Using the Venn diagram, find the value of x.   [4]

(ii) Find the number of students who study mathematics only.   [1]

1 - (0606/11_Summer_2017_Q1) - *Intersection Points, Differentiation*

The line $y = kx - 5$, where k is a positive constant, is a tangent to the curve $y = x^2 + 4x$ at the point A.

(i)   Find the exact value of k.   [3]

(ii)   Find the gradient of the normal to the curve at the point A, giving your answer in the form $a + b\sqrt{5}$, where a and b are constants.   [2]
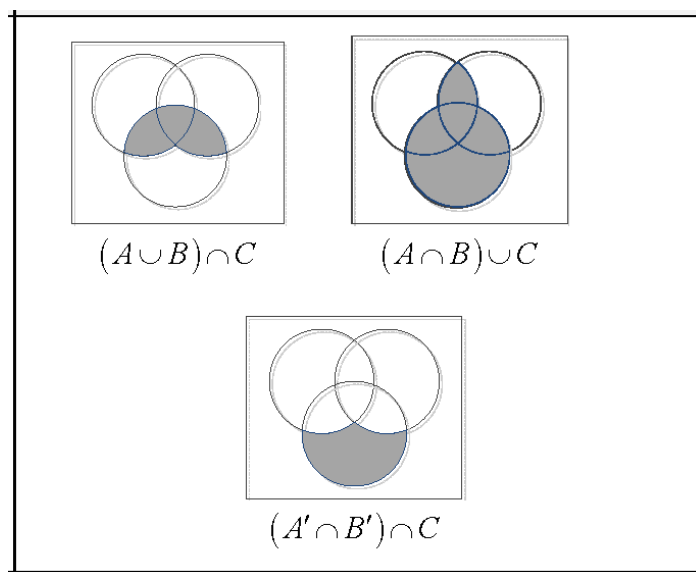
2 - (0606/13_Winter_2017_Q3) - *Intersection Points*

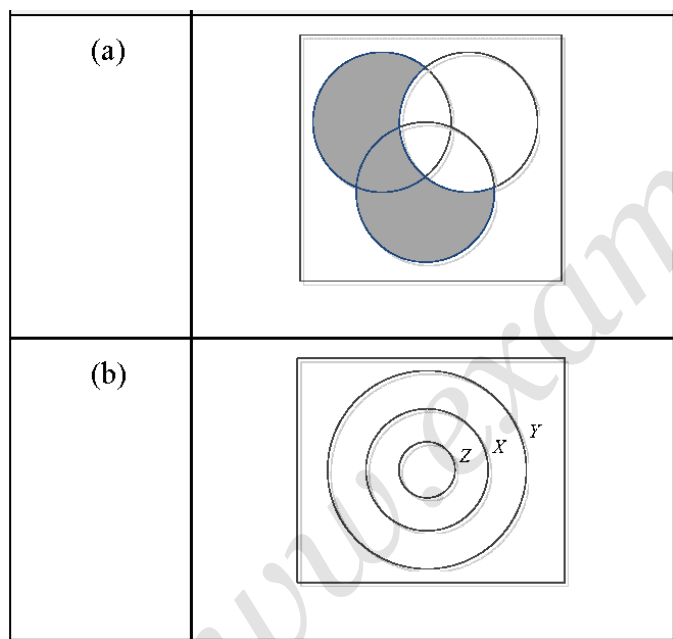Find the set of values of k for which the equation $kx^2 + 3x - 4 + k = 0$ has no real roots. [4]

2 - (0606/13_Winter_2017_Q3) - *Intersection Points*

ANSWERS

1 - (0606/12_Summer_2017_Q1) - *Sets*
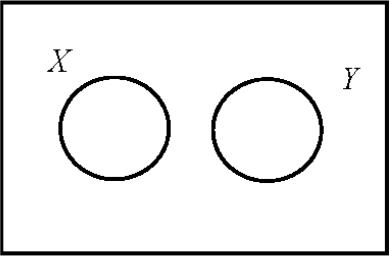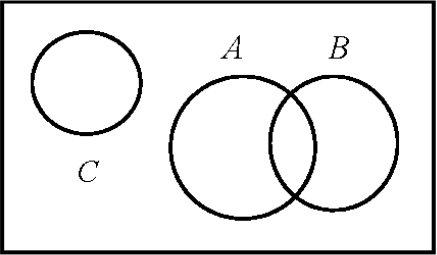

$(A \cup B) \cap C$ $(A \cap B) \cup C$

$(A' \cap B') \cap C$

2 - (0606/13_Summer_2017_Q1) - *Sets*

(a)	
(b)	
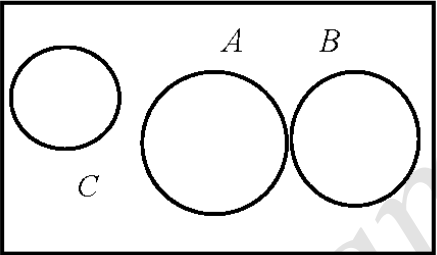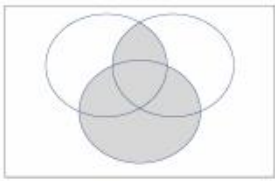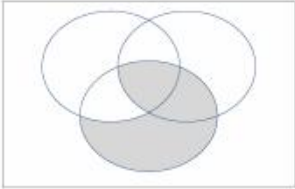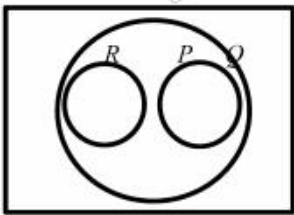
3 - (0606/11_Winter_2017_Q1) - *Sets*

(i)	$A' \cap B$	**B1**
(ii)	$A \cap B \cap C$	**B1**
(iii)	$A \cup B$	**B1**
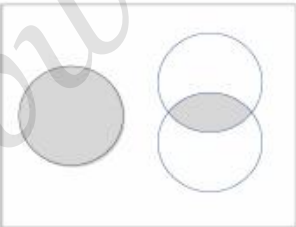
4 - (0606/12_Winter_2017_Q1) - *Sets*

(i)		**1**
(ii)	Either Or 	**2**

5 - (0606/11_Summer_2019_Q1) - *Sets*

(a)		B1	
		B1	
(b)		B2	**B1** for $P \subset R$ and $Q \subset R$ **B1** for $P \cap Q = \varnothing$

6 - (0606/12_Summer_2019_Q1) - *Sets*

(a)		B1	
		B1	

(b)	$P = \{30^\circ, 150^\circ, 210^\circ, 330^\circ\}$	**B1**	May be seen or implied in a Venn diagram Allow without set notation
	$Q = \{30^\circ, 150^\circ\}$	**B1**	May be seen or implied in a Venn diagram Allow without set notation
	$P \cap Q = \{30^\circ, 150^\circ\}$	**B1**	**Dep** on both previous B marks Must be in set notation

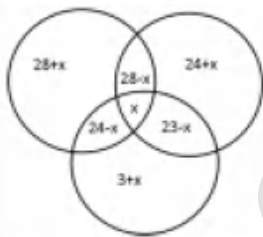**7** - (0606/13_Summer_2019_Q1) - *Sets*

	$A \cap B = \varnothing$	**B1**	
	$Z \subset (X \cap Y)$	**B2**	**B1** for identifying $X \cap Y$

8 - (0606/11_Winter_2019_Q1) - *Sets*

	$A' \cap B$ oe	**B1**	
	$(X \cap Y) \cup (X \cap Z)$ or $X \cap (Y \cup Z)$	**B1**	

9 - (0606/13_Winter_2019_Q1) - *Sets*

(i)		**M1**	for a Venn diagram showing at least 4 correct 'parts' in terms of x
		A1	for all 7 'parts' correct in terms of x on a Venn diagram or in working. May be implied by a correct equation.
	$80 + 24 + x + 23 - x + 3 + x = 145$ $50 + 28 + x + 28 - x + 24 + x = 145$ $75 + 28 + x + 24 - x + 3 + x = 145$ $50 + 80 + 75 - (23 + 28 + 24) + x = 145$ or equivalents	**M1**	for forming an equation in x using sum of 'parts' = 145 or $50 + 80 + 75 - (23 + 28 + 24) + x = 145$ Equations must be seen
	$x = 15$	**A1**	from correct working only
(ii)	43	**B1ft**	for *their* x plus 28

1 - (0606/11_Summer_2017_Q1) - *Intersection Points, Differentiation*

(i)	$kx - 5 = x^2 + 4x$ $x^2 + (4 - k)x + 5 = 0$
	For a tangent $(4 - k)^2 = 20$
	$k = 4 + 2\sqrt{5}$
	Alternative Gradient of line $= k$ Gradient of curve $= \dfrac{dy}{dx} = 2x + 4$ Equating: $k = 2x + 4$
	substitution of $k = 2x + 4$ or $x = \dfrac{k - 4}{2}$ in $kx - 5 = x^2 + 4$ and simplify to a quadratic equation in k or x
	$k = 4 + 2\sqrt{5}$
(ii)	Normal gradient $= -\dfrac{1}{4 + 2\sqrt{5}} \times \dfrac{4 - 2\sqrt{5}}{4 - 2\sqrt{5}}$
	$= -\dfrac{4 - 2\sqrt{5}}{-4} \text{ oe}$ $= 1 - \dfrac{\sqrt{5}}{2}$