

Instructions:

- Answer all questions in the space provided.
 - The marks for each question or part question are shown in the brackets [].
 - **All working must be clearly shown and omission of essential working will result in loss of marks.**
 - If the numerical answer is not exact, correct your answer to *3 significant figures* unless otherwise stated in the question.
 - The use of electronic calculator is permitted.
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Q1 Expand the following expressions

(a) $(2p + r)(5 - 3q)$ [1]

(b) $(y^2 + x^2)(y^2 - x^2)$ [1]

(c) $(2a - 3b)^2$ [2]

(d) $(2x + 3y)(x - 3x^2 + 2y)$ [3]

(e) $(x^2 + y)(x^2 - y - 1) + (x^2 - y)^2$ [3]

Q2 Factorise the following completely

(a) $8x^3y^2 - 18xyz$ [1]

(b) $\frac{a^2}{4} - \frac{b^2c^2}{9}$ [2]

(c) $a - 4b + 3ap - 12bp$ [2]

(d) $x^2 - 19x + 78$ [2]

(e) $9 - 24x + 12x^2$ [2]

(f) $ab^2 - b^2c - 4ac^2 + 4c^3$ [2]

(g) $(a - b)^3 - (b - a)^2$ [3]

Q3 Using **algebraic rules**, find the value of

(a) 497×503 [2]

(b) $3985^2 - 3981 \times 3989$ [2]

(c) $\frac{1}{2} \times 8.75^2 - \frac{1}{2} \times 5.25^2$ [3]

Q4 Given that $a - b = 20$ and $a^2 - b^2 = 480$, find the value of $3a + 3b$. [2]

Q5 If $x - y = 2$ and $x + y = -2$, find the value of $(x^2 - y^2)(x^2 + 2xy + y^2)$. [2]

Q6 Is it possible for the difference of two binomials to be a trinomial? Explain your answer. [2]

Q7 Find three different values of b for which the expression $x^2 + bx + 36$ can be factorised. Show your working clearly and explain how you arrive at your answers. [3]

Bonus

Q8 Factorise $x^2 - 2x + 1 - y^2$ completely [2]

Q9 Factorise $49x^2y^2 + 44xy + 9 - x^2 - y^2$ completely [2]