Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

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Difference of two squares

Time allowed: 1 hour

Subject code **0580**

Mathematics

Paper 2 (Extended)

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 46

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 46 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

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Print at 100% (Actual size) so diagrams keep their real measurements.

1 **(a)** Factorise $p^2 - q^2$.

..... [1]

(b) $p^2 - q^2 = 7$ and $p - q = 2$.

Find the value of $p + q$.

..... [2]

(a) Difference of two squares (b) Difference of two squares Click for more variations

1(a)	$(p-q)(p+q)$ final answer	**1**	
1(b)	$\frac{7}{2}$ oe	**2**	**M1** for $2 \times (p+q) = 7$ or for $(2+q)^2 - q^2 = 7$ or $p^2 - (p-2)^2 = 7$

2 Factorise completely.

$$p^2x - 4q^2x$$

Answer ..... [3]

Difference of two squares Click for more variations

2	$x(p-2q)(p+2q)$	**3**	**M2** for $(px-2qx)(p+2q)$ or $(p-2q)(px+2qx)$ or **M1** for $x(p^2-4q^2)$

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3 Factorise completely.

(a) $ax + ay + 3cx + 3cy$

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

(b) $3a^2 - 12b^2$

Answer(b) ..... [3]

(a) Factorising by grouping (b) Difference of two squares Click for more variations

3	**(a)**	$(a+3c)(x+y)$ final answer	**2**	**B1** for $a(x+y)+3c(x+y)$ or $x(a+3c)+y(a+3c)$
	(b)	$3(a-2b)(a+2b)$ final answer	**3**	**B2** for $3(a-2b)(a+2b)$ seen and then spoiled or $(3a-6b)(a+2b)$ or $(a-2b)(3a+6b)$ or $(a-2b)(a+2b)$ or **B1** for $3(a^2-4b^2)$

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4 Factorise completely.

(a) $px+py-x-y$

..... [2]

(b) $2t^2-98m^2$

..... [3]

(a) Factorising by grouping (b) Difference of two squares Click for more variations

4(a)	$(x+y)(p-1)$ final answer	**2**	**M1** for $p(x+y)-(x+y)$ or $x(p-1)+y(p-1)$
4(b)	$2(t+7m)(t-7m)$ final answer	**3**	**M2** for $(2t+14m)(t-7m)$ or $(t+7m)(2t-14m)$ or correct answer seen or **M1** for $2(t^2-49m^2)$ or $(t+7m)(t-7m)$ or $2(t+7)(t-7)$

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5 **(a)** Factorise.

$$18y - 3ay + 12x - 2ax$$

..... [2]

(b) Factorise.

$$3x^2 - 48y^2$$

..... [3]

(a) Factorising by grouping (b) Difference of two squares Click for more variations

5(a)	$(3y + 2x)(6 - a)$ oe final answer	**2**	**M1** for $3y\,(6 - a) + 2x(6 - a)$ oe or $6(2x + 3y) - a(2x + 3y)$ oe
5(b)	$3(x + 4y)(x - 4y)$ final answer	**3**	**M2** for $(3x + 12y)(x - 4y)$ or $(3x - 12y)(x + 4y)$ or **M1** for $3(x^2 - 16y^2)$ or for $(x + 4y)(x - 4y)$

6 Factorise completely.

(a) $21a^2 + 28ab$

..... [2]

(b) $20x^2 - 45y^2$

..... [3]

(a) Factorising out a common factor (b) Difference of two squares Click for more variations

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6(a)	$7a(3a + 4b)$ final answer	**2**	**B1** for partial factorisation $7(3a^2 + 4ab)$ or $a(21a + 28b)$

6(b)	$5(2x + 3y)(2x - 3y)$ final answer	**3**	**B2** for $(2x + 3y)(2x - 3y)$ or $(10x + 15y)(2x - 3y)$ or $(2x + 3y)(10x - 15y)$ or **B1** for $5(4x^2 - 9y^2)$

7 Factorise completely.

(a) $2m + 3p - 8km - 12kp$

..... [2]

(b) $5x^2 - 20y^2$

..... [3]

(a) Factorising by grouping (b) Difference of two squares Click for more variations

7(a)	$(2m + 3p)(1 - 4k)$ final answer	**2**	**B1** for $2m + 3p - 4k(2m + 3p)$ or better or $2m(1 - 4k) + 3p(1 - 4k)$ or correct answer seen and spoilt
7(b)	$5(x - 2y)(x + 2y)$ final answer	**3**	**B2** for $(5x - 10y)(x + 2y)$ or $(x - 2y)(5x + 10y)$ or correct answer seen then spoilt or **B1** for $5(x^2 - 4y^2)$ or for $(x - 2y)(x + 2y)$

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8 Factorise completely.

(a) $1+x-y-xy$

..... [2]

(b) $2x^3-18xy^2$

..... [3]

(a) Factorising by grouping (b) Difference of two squares Click for more variations

8(a)	$(1+x)(1-y)$ final answer	**2**	**B1** for $1+x-y(1+x)$ or $1-y+x(1-y)$
8(b)	$2x(x+3y)(x-3y)$ final answer	**3**	**B2** for $2x(x^2-9y^2)$ or correctly factorising into two brackets e.g. $(2x^2+6xy)(x-3y), (x^2-3xy)(2x+6y)$ or **B1** for $2(x^3-9xy^2)$ or $x(2x^2-18y^2)$ or for $(x+3y)(x-3y)$

9 Factorise completely.

(a) $12m^2-75t^2$

..... [3]

(b) $xy+15+3y+5x$

..... [2]

(a) Difference of two squares (b) Factorising by grouping Click for more variations

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9(a)	$3(2m + 5t)(2m - 5t)$ final answer	**3**	**B2** for $(6m + 15t)(2m - 5t)$ or $(2m + 5t)(6m - 15t)$ or **B1** for $3(4m^2 - 25t^2)$ or $(2m + 5t)(2m - 5t)$
9(b)	$(x + 3)(y + 5)$ final answer	**2**	**B1** for $x(y + 5) + 3(y + 5)$ or $y(x + 3) + 5(x + 3)$

10 Factorise fully.

(a) $24x^2 - 9xy$

..... [2]

(b) $63x^2 - 28y^2$

..... [3]

(a) Factorising out a common factor (b) Difference of two squares Click for more variations

10(a)	$3x(8x - 3y)$ final answer	**2**	**B1** for $3(8x^2 - 3xy)$ or $x(24x - 9y)$ or $3x(8x - 3y)$ seen then spoilt
10(b)	$7(3x + 2y)(3x - 2y)$ final answer	**3**	**B2** for $(21x + 14y)(3x - 2y)$ or $(3x + 2y)(21x - 14y)$ or $7(3x + 2y)(3x - 2y)$ seen then spoilt or **M1** for $7(9x^2 - 4y^2)$ or $[...](3x + 2y)(3x - 2y)$

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