

The Elmgreen School Maths Bridging Unit

Exercises

A. Multiply out the following brackets:

- | | | |
|-----------------------|--------------------|---------------------|
| 1. $(x+2)(x-5)$ | 2. $(3x-2y)(2x+y)$ | 3. $(2x+1)(2x-1)$ |
| 4. $(a+3b)^2$ | 5. $(4x-7)(2x+3)$ | 6. $(4x-7)(3x-1)$ |
| 7. $(a-b+c)(2a+b-2c)$ | 8. $(5x-9)^2$ | 9. $(x^2+7)(x^2-7)$ |

B. Factorise the following:

- | | | |
|--------------------------|--------------------------|----------------------|
| 1. $x^2 + 6x + 5$ | 2. $x^2 - 8x - 20$ | 3. $t^2 + 5t - 36$ |
| 4. $ad + bd - 3ac - 3bc$ | 5. $2x^2 + 11x + 15$ | 6. $5x^2 - 17x + 6$ |
| 7. $3x^2 - 7x - 6$ | 8. $y^2 - 64$ | 9. $15 + x - 2x^2$ |
| 10. $5x^2 - 125$ | 11. $9x^2 - 12xy + 4y^2$ | 12. $x^4 - 8x^2 - 9$ |

C. Solve these quadratic equations (to 3sf where necessary):

- | | | |
|--------------------------|---------------------------|------------------------------|
| 1. $x^2 + 5x + 6 = 0$ | 2. $x^2 - 8 = 2x$ | 3. $2x^2 + x - 3 = 0$ |
| 4. $2x^2 - 11x + 15 = 0$ | 5. $6x^2 + 13x + 6 = 0$ | 6. $x^2 + 7x + 2 = 0$ |
| 7. $2x^2 + 3x = 8$ | 8. $\frac{2}{x} = 3 + 2x$ | 9. $2x + 1 = \frac{13}{x+2}$ |

D. Make the letter in the square bracket the subject of these:

- | | |
|-------------------------------------|--|
| 1. $v^2 = u^2 + 2as$ [a] | 2. $s = ut + \frac{1}{2}at^2$ [u] |
| 3. $T = 2\pi\sqrt{\frac{l}{g}}$ [l] | 4. $S = \frac{n}{2}[2a + (n+1)d]$ [d] |
| 5. $S = \frac{a}{1-r}$ [r] | 6. $y = \frac{1-x}{2x-3}$ [x] |
| 7. $e = \frac{P-p}{PT-pt}$ [p] | 8. $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$ [u] |

E. Simplify these (using calculator to *check*, not to work out!)

- | | | | |
|-------------------------------|-----------------------------------|----------------------------|--|
| 1. 5^{-3} | 2. $16^{\frac{1}{4}}$ | 3. $8^{\frac{-2}{3}}$ | 4. $\frac{10^8 \times 10^{-3}}{10^{-1}}$ |
| 5. $(4^{-5})^{\frac{1}{2}}$ | 6. $3a^{-4} \times 2a^{-2}$ | 7. $\frac{(9a)^2}{(3a)^4}$ | 8. $\frac{6x \times 12x^5}{8x^{-3}}$ |
| 9. $(16x^{-4})^{\frac{3}{4}}$ | 10. $(x\sqrt{x})^4 \div \sqrt{x}$ | | |