

SHARP

Worksheet 2: Equations and Inequalities

Grade 11 Mathematics

1. Complete the square for each of the following:

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|------------------------------|-------------------------|-------|
| a) $x^2 + 2x$ | b) $x^2 + 5x$ | (R) |
| c) $3x^2 + 12x$ | d) $\frac{1}{2}x^2 + x$ | (R/C) |
| e) $x^2 - 3x + 4$ | f) $x^2 - 4x + 5$ | (R) |
| g) $3x^2 + 7x - 9$ | h) $2x^2 - 3x + 5$ | (C) |
| i) $\frac{1}{3}x^2 + 4x - 9$ | j) $5x^2 - 7x + 6$ | (C) |

2. Solve for x (to two decimal places where necessary):

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|----------------------------|---------------------------------|-----|
| a) $3x^2 - 23x + 14 = 0$ | b) $x^2 - 19x + 21 = 0$ | (C) |
| c) $x^2 + 5x - 66 = 0$ | d) $2x^2 - 13x - 24 = 0$ | (R) |
| e) $2x^2 - 15x + 30 = 0$ | f) $2(x^2 - 5x + 2) = x - 1$ | (C) |
| g) $2x(x - 3) = 5x - 12$ | h) $3x^2 - 13x + 12 = 0$ | (C) |
| i) $4(5x^2 - x + 1) = 17x$ | j) $x^2 - \frac{1}{2}x - 3 = 0$ | (C) |

3. Solve for x :

- | | | |
|-----------------------------------|-------------------------------|-----|
| a) $8 - x \leq 3x$ | b) $4(x - 5) > -3(2 - x)$ | (R) |
| c) $3x(x - 3) \leq 30$ | d) $3x(x - 1) \geq 2(5x - 2)$ | (C) |
| e) $2x(x - 1) > 3(15 - x)$ | f) $2x(x - 2) < 3(5 - x)$ | (C) |
| g) $2x^2 - 3x - 50 \leq 6(x + 1)$ | h) $4x(x - 8) > 5x - 9$ | (C) |
| i) $2x(1 - x) \geq 10 - 7x$ | j) $x(x + 10) < 7(2x - 3)$ | (C) |

4. Solve the following simultaneous equations for x and y :

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|-----------------------------|-----|------------------------------------|-----|
| a) $y = -\frac{2}{x+3} + 4$ | and | $8y = x + 25$ | (C) |
| b) $-y = 2x^2 - 19x + 9$ | and | $y = -3x + 39$ | (C) |
| c) $y = x^2 + x - 30$ | and | $y - 2x = 0$ | (R) |
| d) $y = \frac{3}{x-6} + 1$ | and | $x - y = 3$ | (C) |
| e) $y = \frac{8}{x-1} - 5$ | and | $\frac{1}{2}y = 2x - 2\frac{1}{2}$ | (C) |



