Walking Talking - Quadratics

1. Factorise each of the following expressions.

(a) $6x^3 - 12x^2$

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[2]

(b) $x^2 - x - 42$

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[2]

(c) $15x^2 + 31x + 14$

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[2]

2.

(a) Factorise the following expressions.

(i) $12x^2 + 18xy$ [2]

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(ii) $x^2 - 100$ [1]

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(b) Factorise $x^2 - 5x - 14$ and hence solve $x^2 - 5x - 14 = 0$. [3]

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3.

(a) Express $x^2 - 16x + 66$ in the form $(x + a)^2 + b$ where a and b are values to be found.

[2]

(b) Prove that $\frac{2x + 3}{4} - \frac{3x - 2}{3} + \frac{1}{6} \equiv \frac{19 - 6x}{12}$.

[5]

(c) Simplify $\frac{2x^2 + 5x - 7}{10x + 35}$.

[4]

4.

(a) Express $\frac{x}{x-3} - \frac{x}{x+6}$ as a single fraction in its simplest form.

[3]

(b) Simplify $\frac{49x^2 - 100}{14x + 20}$.

[4]

(c) Simplify $\frac{(2x-5)^8}{(2x-5)^6}$.

[1]

5.

(a) By factorising, solve the following quadratic equation.

$$8x^2 + 18x - 5 = 0$$

[3]

(b) Use the quadratic formula to solve the following quadratic equation, giving your answers correct to 2 decimal places.

$$3x^2 - 5x - 7 = 0$$

[3]

6.

(a) Factorise $6x^2 + 13x - 5$. [2]

(b) Rearrange to make m the subject of the following formula. [3]

$$w = \frac{3m^2}{d}$$

(c) Rearrange to make b the subject of the following formula. [3]

$$ab = bc + e$$

7.

(a) (i) Show that $(x + 2)^2 + 3(x + 1) - 11$ can be simplified to $x^2 + 7x - 4$. [2]

(ii) Solve the equation $x^2 + 7x - 4 = 0$, giving your answers correct to 2 decimal places. [3]

(b) Factorise the expression $5x^2 + 22x - 15$ and hence solve the equation $5x^2 + 22x - 15 = 0$. [3]