

Problem 0580/42/F/M/20 Q5

(a) Write as a single fraction in its simplest form.

$$\frac{x+3}{x-3} - \frac{x-2}{x+2}$$

$$\frac{(x+3)(x+2)}{x-3} - \frac{(x-2)(x-3)}{x+2}$$

$$\frac{x^2 + 5x + 6 - [x^2 - 5x + 6]}{(x-3)(x+2)}$$

$$\frac{x^2 + 5x + 6 - x^2 + 5x - 6}{(x-3)(x+2)}$$

$$\frac{10x}{(x-3)(x+2)} \quad [4]$$

(b)  $2^{12} \div 2^{\frac{k}{2}} = 32$

Find the value of  $k$ .

$$\frac{2^{12}}{2^{\frac{k}{2}}} = 2^5$$

$$12 - \frac{k}{2} = 5$$

$$12 - 5 = \frac{k}{2}$$

$$7 = \frac{k}{2}$$

$k = \underline{14} \quad [2]$

(c) Expand and simplify.

$$(y+3)(y-4)(2y-1)$$

$$y^2 - 4y + 3y - 12$$

$$(y^2 - y - 12)(2y - 1)$$

$$2y^3 - 2y^2 - 24y - y^2 + y + 12$$

$$2y^3 - 3y^2 - 23y + 12$$

$$2y^3 - 3y^2 - 23y + 12 \quad [3]$$

(d) Make  $x$  the subject of the formula.

$$x = \frac{3+x}{y}$$

$$xy = 3 + x$$

$$xy - x = 3$$

$$x(y-1) = 3$$

$$x = \frac{3}{y-1} \quad [3]$$