16 Quadratic equation

Ex 4(

2 i) $(x+8)(x+10)$

$(8+a)(x+10) = x^2 + (8+10)x + 8 \times 10$

$= x^2 + 18x + 80$

ii) $(x+a)(x-b) = x^2 + (a-b)x - ab$

$(x+8)(x-10) = x^2 + (8-10)x - 8 \times 10$

$= x^2 - 2x - 10$

iii) $(x-a)(x+b) = x^2 + (b-a)x - ab$

$(x-8)(x-2)x = x^2 + (10-8)x - 8 \times 10$

$= x^2 - (8+10)x - 8 \times 10$

$= x^2 + 2x - 80$

iv) $(x-a)(x-b) = x^2 - (a+b)x + ab$

$(x-h)(x-10) = x^2 - (8+10)x + 8 \times 10$

Expand

i) $\left(2x - \frac{1}{7}\right)\left(3x + \frac{2}{7}\right)$

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$2x\left(\frac{3x+2}{x}\right) - \frac{1}{x}\left(\frac{3x+2}{x}\right)$

$6x^2 + \frac{4x}{x} - \frac{3x}{x} - \frac{2}{x^2}$

$6x^2 - \frac{2}{x^2} + 1$

ii $\left(\frac{3a+2}{a}\right)\left(\frac{2a-3}{a}\right)$

$3a\left(\frac{2a-3b}{b}\right) + \frac{2}{a}\left(\frac{2a-3b}{b}\right)$

$6a^2 - \frac{9a}{b} + \frac{4a}{b} - \frac{6}{b^2}$

$6a^2 - \frac{9a+4a}{b} - \frac{6}{b^2}$

$6a^2 - \frac{5a}{b} - \frac{6}{ab^2}$

iii $(a+b+c)^2 = a^2+b^2+c^2+2(ab+bc+ca)$

$a = x, b = y, c = -z$

$(x+y-z)^2 = x^2+y^2+(-z)^2+2(xy+yx+(-z)x+(-z)x)$

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$(x+y-z)^2 = x^2+y^2+z^2+2(xy-yz-zx)$

$\therefore (x+y-z)^2 = x^2+y^2+z^2+2xy-2yz-2zx$

ii $a=x, b=2y, c=2$

$(a+b+c)^2 = a^2+b^2+c^2+2(ab+bc+ca)$

$(x-2y+2)^2 = x^2+(-2y)^2+2^2+2(x(-2y)+(-2y)2+2x)$

$= x^2+4y^2+4+2(-2xy-4y+2x)$