Working with Algebra Revision

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Make x the subject of the formulae

1) $2x + y = 5x - w$

$y = 5x - 2x - w$

$y + w = 3x$

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

2) $\frac{x+t}{r} = q$

$x + t = qr$

$x = qr - t$

3) $\frac{p}{x+q} = \frac{m}{x-q}$

$p(x-q) = m(x+q)$

$xp - pq = mx + qm$

$xp - mx = pq + qm$

$x(p-m) = q(p+m)$

$x = \frac{q(p+m)}{(p-m)}$

Solve for x and y

$\times 5 \quad 2x + 3y = 11$

$\times 2 \quad 5x + 7y = 25$

$10x + 15y = 55$

$- \quad 10x + 14y = 50$

$0x + y = 5$

if $\boxed{y = 5}$

$2x + 3 \times 5 = 11$

$2x + 15 = 11$

$2x = -4 \quad \boxed{x = -2}$

Express in the form $(x+p)^2 + q$

1) $x^2 + 6x - 5$

$(x+3)^2 - 5 - 9$

$(x+3)^2 - 14$

2) $x^2 - 10x + 18$

$(x-5)^2 + 18 - 25$

$(x-5)^2 - 7$

3) $x^2 - 12x + 36$

$(x-6)^2 + 36 - 36$

$(x-6)^2$

Expand

1) $3(x+4)$

$3x + 12$

2) $2(3x-5)$

$6x - 10$

3) $4x(x^2 - 3x + 2y)$

$4x^3 - 12x^2 + 8yx$

Expand and simplify

1) $2(x+4) + 3(x+5)$

$2x + 8 + 3x + 15 = 5x + 23$

2) $5(x-7) - 2(x+4)$

$5x - 35 - 2x - 8 = 3x - 43$

3) $6(x+5) - 3(x-7)$

$6x + 30 - 3x + 21$

$= 3x + 51$

4) $3(x+2) - (x-4)$

$= 3x + 6 - x + 4$

$= 2x + 10$

Expand and simplify

1) $(x+2)(x-3)$

$x^2 + 2x - 3x - 6$

$= x^2 - x - 6$

2) $(x-2)(x-7)$

$x^2 - 2x - 7x + 14 = x^2 - 9x + 14$

3) $(x-5)^2$

$x^2 - 5x - 5x + 25 = x^2 - 10x + 25$

4) $(2x-4)(3x+5)$

	$3x$	$+5$
$2x$	$6x^2$	$+10x$
-4	$-12x$	-20

$6x^2 - 2x - 20$

$2(3x^2 - x - 10)$

Solve

1) $x^2 = 64$

$x = \pm 8$

2) $4x^2 = 100$

$x^2 = 25$

$x = \pm 5$

3) $2x^2 + 4 = 36$

$2x^2 = 32$

$x^2 = 16$

$x = \pm 4$

4) $\frac{x^2 - 5}{2} = 58$

$x^2 - 5 = 116$

$x^2 = 121$

$x = \pm 11$

Solve

1) $\frac{x}{4} - 7 = -5$

$\frac{x}{4} = -5 + 7$

$\frac{x}{4} = 2$

$x = 8$

2) $\frac{x+4}{6} = 3$

$x + 4 = 18$

$-4 \quad -4$

$x = 14$

3) $\frac{3(x+4)}{5} = 6$

$\frac{3x+12}{5} = 6$

$3x + 12 = 30$

$3x = 18$

$x = 6$

4) $\frac{2}{x+2} = \frac{3}{x-5}$

$2(x-5) = 3(x+2)$

$2x - 10 = 3x + 6$

$-10 - 6 = 3x - 2x$

$-16 = x$

Solve

1) $3x - 5 = 29$

$3x = 34$

$x = 11\frac{1}{3}$

2) $2(x+7) = 29$

$2 \times (14.5) = 29$

$x + 7 = 14.5$

$x = 7.5$

3) $5x + 6 = 2x - 36$

$3x = -36 - 6$

$3x = -42$

$x = -14$

4) $7 - 3x = 7x - 15$

$7 + 15 = 7x + 3x$

$22 = 10x$

$2.2 = x$

Factorise and solve

1) $x^2 - 8x + 15 = 0$

$(x-5)(x-3) = 0$

$x = 5$ or $x = 3$

2) $x^2 - 5x - 14 = 0$

$(x-7)(x+2) = 0$

$x = 7$ or $x = -2$

3) $x^2 - 144 = 0$

$(x+12)(x-12)$

$x = -12$ and $x = 12$

4) $4x^2 - 81 = 0$

$(2x-9)(2x+9) = 0$

$x = \frac{9}{2}$ or $x = -\frac{9}{2}$

Factorise

1) $2x^2 + 3x$

$x(2x+3)$

2) $5pq^2 - 7p^2q$

$pq(5q - 7p)$

3) $x^2 + 6x + 8$

$(x+4)(x+2)$

4) $x^2 + x - 12$

$(x-3)(x+4)$

5) $x^2 - 25$

$(x+5)(x-5)$

Expand and simplify

1) $(x+3)(x^2 + 2x + 4)$

	x^2	$+2x$	$+4$
x	x^3	$+2x^2$	$+4x$
$+3$	$+3x^2$	$+6x$	$+12$

$\boxed{x^3 + 5x^2 + 10x + 12}$

2) $(x+5)(x+2)(x-3)$

$(x^2 + 7x + 10)(x-3)$

$\boxed{x^3 + 4x^2 - 11x - 30}$

	x^2	$+7x$	$+10$
x	x^3	$+7x^2$	$+10x$
-3	$-3x^2$	$-21x$	-30

3) $(x-2)(x-4)(x+5)$

	$x^2 - 6x + 8$
x	$x^3 - 6x^2 + 8x$
$+5$	$5x^2 - 30x + 40$

$x^3 - x^2 - 22x + 4$