

Solve

a) $2(5x - 1) - 4 = 10$

b) $\frac{4x}{5} - \frac{x-1}{3} = 1$

c) $x^2 + 5x - 6 = 0$

d) $\frac{5}{2x+1} + \frac{4}{x} = 3$

e) $|7 - x| = 3$

f) $|x + 12| = |2x + 6|$

g) $|2x + 1| = 3 - 4x$

h) $6x - 1 \geq 8$

i) $5 - \frac{x}{2} > 7$

j) $|x + 2| \leq 4$
and graph on the no. line

k) $|2x - 1| > 5$
and graph on the no. line

l) $5x + 2y = 9$ and
 $4x - 3y = -25$

m) $xy = 3$ and
 $2x + 3y = 9$

2. Solve

$$\frac{x+2}{2x+1} \geq 1$$

3. Factorise fully:

a) $2x - 6y - xy + 3y^2$

b) $a^2b - b^3$

c) $\frac{27x^3 - y^3}{64}$

d) $8y^2 + 2y - 3$

e) $9x^2 + 9x - 10$

4. Simplify

a) $\frac{x^2 - 16}{x^2 + 2x - 8} \div \frac{x^2 + 4x}{2x^2 - 3x}$

b) $\frac{x}{pq} + \frac{q}{px}$

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

d) $\frac{m}{n^2 - nm} + \frac{1}{n}$

1) a) $10x - 2 - 4 = 10$
 $10x - 6 = 10$
 $10x = 16$
 $x = 1\frac{3}{5}$ ✓

b) $\frac{4x}{5} - \frac{x-1}{3} = 1$
 $3(4x) - 5(x-1) = 15(1)$
 $12x - 5x + 5 = 15$
 $7x = 10$
 $x = \frac{10}{7} = 1\frac{3}{7}$ ✓

c) $(x+6)(x-1) = 0$
 $x = 1, -6$ ✓

d) $5(x) + 4(2x+1) = (x)(2x+1)(3)$
 $5x + 8x + 4 = 6x^2 + 3x$
 $13x + 4 = 6x^2 + 3x$
 $6x^2 - 10x - 4 = 0$
 $(6x+2)(6x-12) = 0$
 $(3x+1)(x-2) = 0$
 $x = -\frac{1}{3}, 2$ ✓

e) $7-x = 3$ OR $7-x = -3$
 $-x = -4$ $-x = -10$
 $x = 4$ $x = 10$ ✓

f) $x+12 = 2x+6$ OR $x+12 = -(2x-1)$
 $6 = x$ $x+12 = -2x-1$
 $x = 6$ $3x = -13$
 $x = -\frac{13}{3}$ ✓

g) $2x+1 = 3-4x$ OR $-(2x+1) = 3-4x$
 $6x = 2$ $-2x-1 = 3-4x$
 $x = \frac{1}{3}$ ✓ $2x = 4$
 $x = 2$ ✓

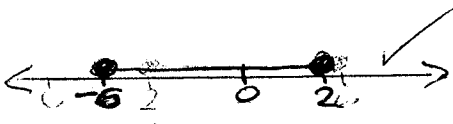
h) $6x-1 \geq 8$
 $6x \geq 9$
 $x \geq 1\frac{1}{2}$ ✓

check soln

i) $5 - \frac{x}{2} > 7 > 0$
 $\frac{5(2-x) - 7(2)}{2} > 0$
 $\frac{10-x-14}{2} > 0$
 $\frac{-4-x}{2} > 0$

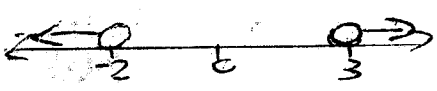
j) $x+2 \leq 4$ OR $-(x+2) \geq 4$ $x+2 \geq -4$
 $x \leq 2$ $-x-2 \geq 4$ $x \geq -6$
 $\therefore -6 \leq x \leq 2$ ✓

k) $(-4-x)(2) > 0$
 $x = -4$ ✗



l) $2x-1 > 5$ OR $2x-1 \leq -5$
 $2x > 6$ $2x < -4$
 $x > 3$ $x < -2$
 $\therefore x > 3$ OR $x < -2$

1) $5x+2y = 4$
 2) $4x-3y = -25$
 $1) \times 4 = 20x+8y = 16$
 $2) \times 5 = 20x-15y = -125$
 $23y = 161$
 $y = 7$



m) $5 - \frac{x}{2} > 7$
 $-\frac{x}{2} > 2$
 $-x > 4$ $x < -4$

1) $5x+2(7) = 9$
 $5x+14 = 9$
 $5x = -5$
 $\therefore x = -1, y = 7$ ✓

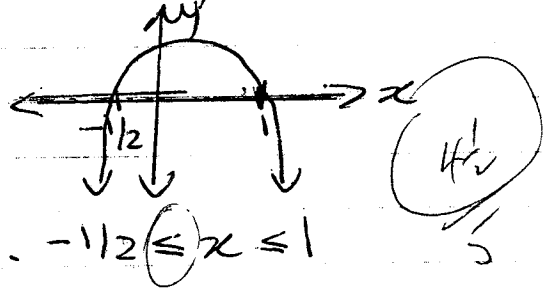
m) 1) $xy = 3$
 2) $2x + 3y = 9$
 1) $\rightarrow x = \frac{3}{y}$
 2) $2(\frac{3}{y}) + 3y = 9$
 $\frac{6}{y} + 3y = 9$
 $6 + 3y^2 - 9y = 0$
 $3y^2 - 9y + 6 = 0$
 $(3y + 6)(3y - 3) = 0$
 $(y - 2)(y - 1) = 0$
 $\therefore y = 2, 1$

1) $\rightarrow x(2) = 3$ OR $x(1) = 3$
 $2x = 3$ $x = 3$
 $x = 1\frac{1}{2}$
 $\therefore x = 1\frac{1}{2}, y = 2$ OR
 $x = 3, y = 1$

$\frac{36}{40}$

2) $\frac{x+2}{2x+1} \geq 1 \rightarrow x \neq -\frac{1}{2}$
 $\frac{x+2}{2x+1} - 1 \geq 0$
 $\frac{x+2 - 1(2x+1)}{2x+1} \geq 0$
 $\frac{x+2 - 2x - 1}{2x+1} \geq 0$
 $\frac{1-x}{2x+1} \geq 0$

$(1-x)(2x+1) \geq 0$
 $\therefore x = 1, -\frac{1}{2}$



3) a) $2(x-3y) - y(x-3y)$
 $= (2-y)(x-3y)$

b) $b(a^2 - b^2)$
 $b(a-b)(a+b)$

c) $27x^3 - 64y^3$
 $(3x-4y)(9x^2 + 12xy + 16y^2)$

d) $(8y+6)(8y-4)$
 $(4y+3)(2y-1)$

e) $(9x+15)(9x-6)$
 $(3x+5)(3x-2)$

4) a) $\frac{(x-4)(x+4)}{(x-2)(x+4)} \times \frac{(2x+1)(x-2)}{(x+8)(x-4)}$
 $= \frac{2x+1}{x+8}$

b) $\frac{x}{pq} + \frac{q}{px}$
 $= \frac{px + q^2}{pqx}$
 $= \frac{z^2 + p^2}{pqx}$

c) $\frac{4(x+2) - 3(x-2)}{(x-4)(x)}$
 $= \frac{4x+8 - 3x+6}{12x}$
 $= \frac{x+14}{12x}$

~~$\frac{m + \sqrt{1-m}}{n(n-m)}$~~
 ~~$= \frac{m + 1 - m}{n(n-m)}$~~
 ~~$= \frac{1}{n(n-m)}$~~

d) $\frac{m + 1(n-m)}{n(n-m)}$
 $= \frac{m + n - m}{n(n-m)}$
 $= \frac{n}{n(n-m)}$
 $= \frac{1}{n-m}$

$\frac{1}{2} + 2 =$
 $\frac{1}{2}(1 + 4) = \frac{5}{2}$
 $= 2\frac{1}{2}$

$\frac{9}{10}$

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