

# IGCSE Higher Week 6 Answers

1 a)  $1\frac{8}{21}$  b)  $4\frac{3}{66}$  c)  $5\frac{7}{18}$  d)  $1\frac{9}{20}$  e)  $7\frac{7}{12}$  f)  $7\frac{7}{10}$   
 g)  $3\frac{5}{7}$  h)  $1\frac{5}{19}$

2 a)  $3(3x+4)$  b)  $y(2+y)$  c)  $(x+4)(x+5)$  d)  $3x(3-x)$   
 e)  $(x+5)(x-5)$  f)  $9ab(3b+4)$  g)  $(x-9)(x-4)$   
 h)  $2(x+6)(x-6)$

3, a)  $\frac{2(x+y)}{2} = x+y$  b) 4 c)  $5\frac{1}{2}$  d)  $\frac{x+y}{y}$  e)  $b+4$

f)  $\frac{2}{3}$  g)  $\frac{x}{2}$  h)  $\frac{a}{d}$  i)  $2x+y$  j)  $2+3a$

k)  $\frac{2x^2y(2x-5y^2)}{2x^2z(x-4)} = \frac{y(2x-5y^2)}{z(x-4)}$  l)  $\frac{2x(8b+9c)}{3x(8b+9c)} = \frac{2}{3}$

m)  $3\frac{1}{4}$  n)  $\frac{(x+10)(x+10)}{(x+10)} = (x+10)$  o)  $(x+6)$  p)  $\frac{1}{(x-1)}$

q)  $\frac{(2x+1)(x+3)}{(x+3)(x-3)} = \frac{(2x+1)}{(x-3)}$  r)  $\frac{(x+5)}{(x+4)}$

4, a)  $\frac{5x+3}{6}$  b)  $\frac{4x+3}{4}$  c)  $\frac{8x+2}{15}$  d)  $\frac{2(x+1)-3x}{6} = \frac{2-x}{6}$

e)  $\frac{6x-2(x+1)}{12} = \frac{4x-2}{12} = \frac{2x-1}{6}$  f)  $\frac{5(x-1)-4(x+2)}{20} = \frac{x-13}{20}$

g)  $\frac{7(3x-1)+5(1-3x)}{35} = \frac{6x-2}{35}$  h)  $\frac{4(4x-3)-3(2x+3)}{12} = \frac{10x-21}{12}$

i)  $\frac{4x+10(x+2)-5(x+1)}{20} = \frac{4x+10x+20-5x-5}{20} = \frac{9x+15}{20}$

$$5, a) \frac{2}{2x} + \frac{1}{2x} = \frac{3}{2x}$$

$$b) \frac{-13}{3x}$$

$$c) \frac{11}{4x}$$

$$d) \frac{5+7x}{x^2}$$

$$e) \frac{5y-2x}{x^2y}$$

$$f) \frac{3x+5x+5}{x(x+1)} = \frac{8x+5}{x(x+1)}$$

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

$$h) \frac{10-x}{(x-3)(x+4)}$$

$$i) \frac{1}{(x+1)} + \frac{1}{(x+1)(x+2)}$$

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

$$= \frac{x+3}{(x+1)(x+2)}$$

$$= \frac{x-5}{(x+1)(x-1)}$$

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

$$k) \frac{(x-4)(x+3) - (x-3)(x+4)}{(x+4)(x-4)} \Rightarrow \frac{x^2-x-12 - (x^2+x-12)}{(x+4)(x-4)}$$

$$= \frac{x^2-x+12 - x^2-x+12}{(x+4)(x-4)} = \frac{-2x}{(x+4)(x-4)}$$

$$l) \frac{x+3}{x+3} + \frac{5}{x+3} = \frac{x+8}{x+3} \quad m) \frac{3x+3-1}{x+1} \Rightarrow \frac{3x+2}{x+1}$$

$$6) c) \frac{2x^2}{10} = \frac{x^2}{5}$$

$$b) \frac{3(x+1)}{3x} = \frac{3(x+1)}{x}$$

$$c) \frac{x+7}{x+2}$$

$$d) \frac{x-3}{6} \times \frac{x+1}{x-3} = \frac{x+1}{6}$$

$$e) \frac{2(x+1)}{2(x-3)} \times \frac{(x-3)}{(x-4)} = \frac{2x+1}{x-4}$$

$$f) \frac{(2x+3)(x-6)}{(x-7) \times 5(2x+3)} = \frac{(x-6)}{5(x-7)}$$

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

$$h) \frac{(x+2)}{(x+4)} \times \frac{2(x+4)(x-4)}{(x-4)(x+2)} = 2$$

$$7) a) x = 21$$

$$b) \begin{aligned} 3x &= x+6 \\ x &= 3 \end{aligned}$$

$$c) \begin{aligned} 5x-30 &= 4x+12 \\ x &= 42 \end{aligned}$$

$$d) \begin{aligned} 6-9x &= 24 \\ -18 &= 9x \\ x &= -2 \end{aligned}$$

$$e) 2x-3+2(x+2) = 15$$

$$4x+1 = 15$$

$$4x = 14$$

$$x = 3.5$$

$$f) 3x-6+10x = 20$$

$$13x = 26$$

$$x = 2$$

$$g) 3(1+x) = 2(2+x) + 6$$

$$3+3x = 4+2x+6$$

$$x = 7$$

$$8, a) 12 = 4x$$

$$x = 3$$

$$b) 14 = x^2 + 5x$$

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

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

$$x = -7 \text{ \& } x = 2$$

$$c) 20 = 3x^2 - 7x$$

$$3x^2 - 7x - 20 = 0$$

$$(3x+5)(x-4) = 0$$

$$x = -5/3 \text{ \& } x = 4$$

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

$$x^2 - x - 2 = x^2 + 2x$$

$$-2 = 3x$$

$$x = -2/3$$

$$e) (x-2)(2x+4) = (x+4)(x-1)$$

$$2x^2 - 8 = x^2 + 3x - 4$$

$$x^2 - 3x - 4 = 0$$

$$(x-4)(x+1) = 0$$

$$x = 4 \text{ \& } x = -1$$

$$8) 7(x+4) - 4(x-1) = (x-1)(x+4)$$

$$7x + 28 - 4x + 4 = x^2 + 3x - 4$$

$$3x + 32 = x^2 + 3x - 4$$

$$0 = x^2 - 36$$

$$(x-6)(x+6) = 0 \quad x = \pm 6$$

$$9) \frac{(x-3)(x+3)}{(x-1)(x+3)} = \frac{x-3}{2x-1}$$

$$10) \frac{(z+2)(z+5) - z(z-1)}{(z-1)(z+5)} = \frac{z^2 + 7z + 10 - z^2 + z}{(z-1)(z+5)}$$

$$= \frac{8z + 10}{(z-1)(z+5)}$$

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

$$11) \frac{(2x-5)(x+1)}{(x+5)(x+1)} = \frac{2x-5}{x+5}$$

where  $a=2$   $b=-5$   
 $c=1$   $d=5$

$$12) \frac{x}{2x-3} + \frac{4}{x+1} = 1$$

$$x(x+1) + 4(2x-3) = (2x-3)(x+1)$$

$$x^2 + x + 8x - 12 = 2x^2 - x - 3$$

$$x^2 - 8x - 15 = 0$$

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

$$x = 5 \text{ \& } x = 3$$

$$13, \frac{5(x+3) - 4(x-3)}{(x+3)(x-3)} = \frac{5x+15-4x+12}{(x+3)(x-3)} = \frac{x+27}{(x+3)(x-3)}$$

$$14, 4 - \left[ \frac{(x+3)}{1} \times \frac{x-2}{x^2+5x+6} \right]$$

$$\Rightarrow 4 - \left[ \frac{(x+3)(x-2)}{(x+3)(x+2)} \right]$$

$$\Rightarrow \frac{4(x+2)}{(x+2)} - \frac{(x-2)}{(x+2)}$$

$$\frac{4x+8-x+2}{x+2}$$

$$\frac{3x+11}{x+2}$$