

# Elementary Mathematics 6101

## Exercise Sheet 1 - Solutions

September 9, 2011

1. (a)  $3 \cdot (1 + 2) = 3 \cdot 1 + 3 \cdot 2 = 3 + 6 = 9$
- (b)  $x \cdot (1 + 2) = x \cdot (3) = 3x$
- (c)  $3 \cdot (2x + x) = 3 \cdot (2x) + 3 \cdot x = 6x + 3x = 9x$
- (d)  $(1 + 2) \cdot (x + 1) = 1 \cdot (x + 1) + 2 \cdot (x + 1) = 1 \cdot x + 1 \cdot 1 + 2 \cdot x + 2 \cdot 1 = x + 1 + 2x + 2 = 3 + 3x$
- (e)  $(3a)^2 = (3a) \cdot (3a) = 9a^2$
- (f)  $\frac{22ab}{11b} = \frac{(11b) \cdot (2a)}{11b} = \frac{\cancel{11b} \cdot (2a)}{\cancel{11b}} = 2a$
- (g)  $\frac{12m^2}{6m} = \frac{(6m) \cdot (2m)}{6m} = \frac{\cancel{6m} \cdot (2m)}{\cancel{6m}} = 2m$
- (h)  $\frac{36xy}{18x} = \frac{(18x) \cdot (2y)}{18x} = \frac{\cancel{18x} \cdot (2y)}{\cancel{18x}} = 2y$
  
- (a)  $5^{-1} = \frac{1}{5}$
- (b)  $64^{1/6} = (8^2)^{1/6} = 8^{2/6} = 8^{1/3} = (2^3)^{1/3} = 2^{3/3} = 2^1 = 2$
- (c)  $27^{-1/3} = (3^3)^{-1/3} = 3^{-3/3} = 3^{-1} = \frac{1}{3}$
- (d)  $(\frac{1}{4})^{\frac{3}{2}} = (4^{-1})^{3/2} = 4^{-3/2} = (2^2)^{-3/2} = 2^{-2 \cdot \frac{3}{2}} = 2^{-\cancel{2} \cdot \frac{3}{\cancel{2}}} = 2^{-3} = \frac{1}{2^3} = \frac{1}{8}$
  
- (a)  $(x - 2)(x + 1)$
- (b)  $(x - 1)(x - 1) = (x - 1)^2$
  
- (a) 2
- (b) 0.5
- (c)  $3! = 3 \cdot 2 \cdot 1 = 3 \cdot 2 = 6$
- (d)  $\frac{100!}{99!} = \frac{100 \cdot 99!}{99!} = \frac{\cancel{100 \cdot 99!}}{\cancel{99!}} = 100$
  
- (a)  $2x - 3 > 0 \Rightarrow 2x - 3 + 3 > 0 + 3 \Rightarrow 2x > 3 \Rightarrow \frac{2x}{2} > \frac{3}{2} \Rightarrow \frac{\cancel{2}x}{\cancel{2}} > \frac{3}{2} \Rightarrow x > \frac{3}{2}$
- (b)  $2 - x < 1 \Rightarrow 2 - x + x < 1 + x \Rightarrow 2 < 1 + x \Rightarrow 2 - 1 < 1 + x - 1 \Rightarrow 1 < x \Rightarrow x > 1$