

# MTH1W Review — Final Answers

Final answers only. Equivalent forms are fine (for example, 0.125 for  $\frac{1}{8}$ ).

## A. Exponent laws

**A1** a) 32                      b) 81                      c)  $-81$                       d) 1                      e)  $\frac{1}{8}$

**A2** a)  $3^9$                       b)  $7^6$                       c)  $5^{12}$   
d)  $2^4$                       e)  $x^{10}$                       f)  $y^7$

**A3** a)  $-12x^8$                       b)  $3a^5b^2$                       c)  $16m^{12}$   
d)  $-27x^6y^3$                       e)  $3x^2$                       f)  $x^{12}$

**A4** a)  $4.5 \times 10^6$   
b)  $3.2 \times 10^{-5}$   
c)  $6 \times 10^9$   
d) The bases should not be multiplied. Keep the base and add the exponents:  $2^3 \times 2^4 = 2^7 = 128$ .

## B. Simplifying expressions

**B1** a)  $3x + 10$                       b)  $6a^2 + 2a - 1$                       c)  $5xy - 4x$

**B2** a)  $8x - 20$                       b)  $-3x^2 + 12x - 6$                       c)  $6x^2 + 14x$   
d)  $-x + 13$                       e)  $8a$                       f)  $-x^2 + 10x$

**B3** a) equivalent                      b) not equivalent ( $6x - 54$ )  
c) equivalent                      d) not equivalent

**B4** a)  $6x + 10$   
b)  $2x^2 + 10x$   
c) perimeter 28, area 48

## C. Solving equations

**C1** a)  $x = -6$                       b)  $x = 5.5$                       c)  $x = 6$   
d)  $x = 16$                       e)  $x = 8$                       f)  $x = 4$

**C2** a)  $x = \frac{y+6}{3}$                       b)  $y = -\frac{2}{5}x + 2$                       c)  $w = \frac{P-2l}{2}$  or  $w = \frac{P}{2} - l$

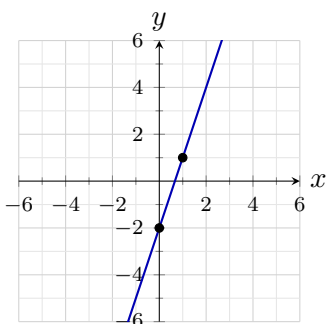
**C3**  $3n - 8 = 25$ , so the number is 11.

## D. Graphing lines

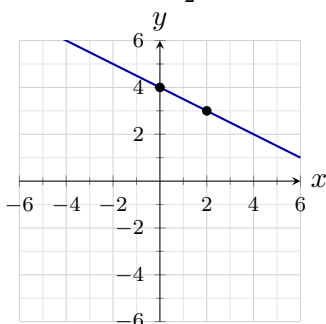
- D1** a) slope 2,  $y$ -intercept  $-5$   
c) slope 0,  $y$ -intercept 6  
e) slope  $\frac{1}{2}$ ,  $y$ -intercept  $-3$

- b) slope  $-\frac{3}{4}$ ,  $y$ -intercept 1  
d) slope  $-3$ ,  $y$ -intercept 8

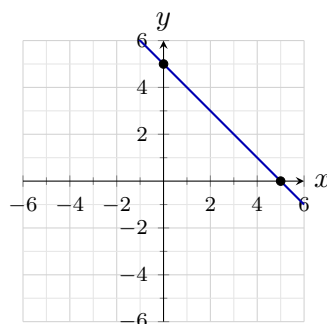
**D2** a)  $y = 3x - 2$



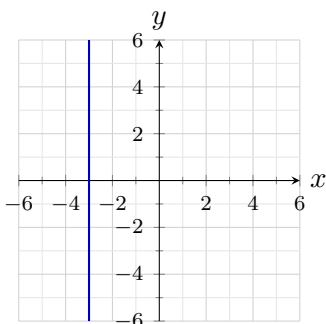
b)  $y = -\frac{1}{2}x + 4$



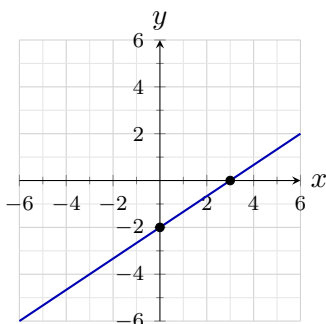
c)  $x + y = 5$



d)  $x = -3$



e)  $2x - 3y = 6$



e)  $y = \frac{2}{3}x - 2$ :  $x$ -intercept 3,  $y$ -intercept  $-2$ .

- D3** a) 3

b)  $-\frac{2}{3}$

c) undefined (vertical line)

d) 0 (horizontal line)

**D4** a)  $y = 4x - 7$

b)  $y = -2x + 7$

c)  $y = 2x - 1$

d)  $y = -\frac{3}{2}x + 3$

e)  $y = 3x + 5$

**D5** a)  $y = 2x + 3$ ,  $y = 2x - 5$  and  $4x - 2y = 6$  (all have slope 2)

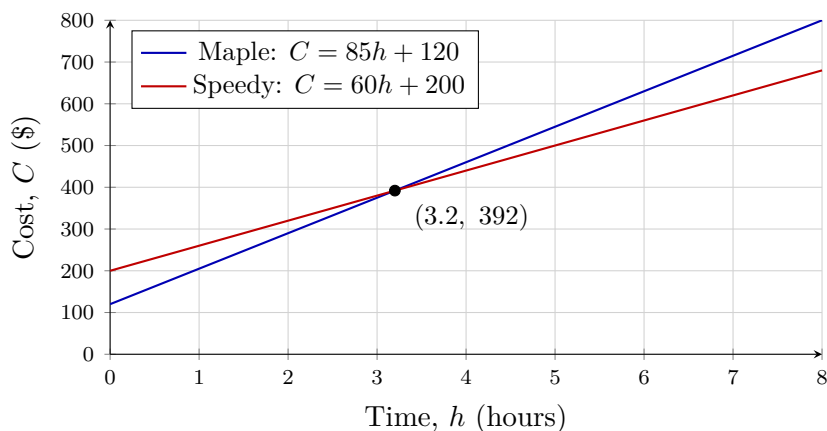
b)  $y = -3x - 2$

c) They cross at  $90^\circ$  (perpendicular). The slopes 2 and  $-\frac{1}{2}$  are negative reciprocals: their product is  $-1$ .

- D6** a) translated up 3 units  
 b) reflected in the  $y$ -axis (or the  $x$ -axis)  
 c) rotated about the origin, so it is steeper (either idea is enough)

## E. Linear relations in real situations

- E1** a)  $C = 85h + 120$   
 b) \$502.50  
 c) 8 hours  
 d) Slope: the cost goes up \$85 for every hour (the rate of change).  $C$ -intercept: the \$120 flat fee, charged even before any time is worked.
- E2** a)  $C = 60h + 200$   
 b) see the graph below  
 c) (3.2, 392)  
 d) At 3.2 hours (3 h 12 min) both companies charge \$392. Maple Movers is cheaper for shorter moves; Speedy Moves is cheaper for longer moves.  
 e) Speedy Moves (\$560 compared with \$630), by \$70



- E3** a) Yes: the first differences are constant ( $-750$  L every 5 minutes).  
 b)  $-150$  L/min  
 c)  $W = -150t + 12\,000$   
 d) after 80 minutes

- E4** a) linear                      b) non-linear                      c) non-linear                      d) linear

## F. Right triangles and proportions

- F1** a) 15 cm                                      b) 12 m

**F2** 12 m