Homework 1a

§ 1 Algebra and Common Factors

1. Simplify:
   (a) \(2x - 5x + 9x\)  
   (b) \(3a + a + 4a\)  
   (c) \(11x - 4x + 8x\)  
   (d) \(4b + 5c + 7b - 2c\)  
   (e) \(7w + 3v + 3w - 5v\)  
   (f) \(5d - 4e + 2d\)

2. Simplify:
   (a) \(2x - 5x\)  
   (b) \(-3a + a\)  
   (c) \(7x - 4x\)  
   (d) \(5p + (-8p)\)  
   (e) \(-2e + 7e\)  
   (f) \(-d - 3d\)  
   (g) \(4h + (-2h)\)  
   (h) \(-9a + (-a)\)  
   (i) \(4k - (-2k)\)  
   (j) \(-4p - (-2p)\)  
   (k) \(-m - m\)  
   (l) \(-5y - (-8y)\)

3. Evaluate each of the following expressions when \(a = 2\), \(b = -4\) and \(c = -3\).
   (a) \(a + b\)  
   (b) \(a - b\)  
   (c) \(2a + c\)  
   (d) \(ab\)  
   (e) \(bc\)  
   (f) \(b - c\)  
   (g) \(a + 2c\)  
   (h) \(3b + 6a\)  
   (i) \(2c - 2b\)  
   (j) \(b^2\)  
   (k) \(3c^2\)  
   (l) \((2b)^2\)

4. Expand the following:
   (a) \(2(x + 2)\)  
   (b) \(5(a + 3)\)  
   (c) \(3(x - 4)\)  
   (d) \(4(p - 9)\)  
   (e) \(7(e + 7)\)  
   (f) \(11(2d - 3)\)  
   (g) \(4(3h + 5)\)  
   (h) \(2(5 - 4a)\)

5. Expand and simplify the following:
   (a) \(6 + 2(x + 2)\)  
   (b) \(2(g + 4) - 5\)  
   (c) \(4(z - 2) + 10\)  
   (d) \(7(q + 5) + 3q\)  
   (e) \(8(e + 1) - 13\)  
   (f) \(3(2d - 3) - 7d\)

6. Factorise:
   (a) \(2x + 20\)  
   (b) \(12a + 15\)  
   (c) \(9x - 6\)  
   (d) \(4k - 18\)  
   (e) \(15e + 25\)  
   (f) \(16d - 36\)  
   (g) \(14h + 21\)  
   (h) \(28 - 42a\)  
   (i) \(9j + 81\)  
   (j) \(24t - 18\)  
   (k) \(20u - 80\)  
   (l) \(26r + 39\)
Homework 1b

§ 2 Statistics

1 For each set of numbers below, calculate: i) the range; ii) the mean.

(a) 5 7 3 8 8 5 3 9
(b) 23 53 21 34 87 64
(c) 1.4 4.7 7.1 12.2 4.6 13.1 20.2 11.8 5.0

2 For each set of numbers below, establish the median and state the mode:

(a) 2 3 3 3 4 4 5 7 7 8 8
(b) 32 45 33 17 22 54 45
(c) 6.3 1.7 8.8 1.2 8.6 4.1 10.7 6.3 6.3
(d) 8 12 56 24 36 12 24 24

3 The mean height of eight tomato plants is 42cm. A ninth plant is added to the group and the mean height of all nine plants is 43cm. Establish the height of the ninth plant.

Homework 1c

§ 3 Mixed

1 Calculate each of the following.

(a) 4 − 7  (b) −3 + 8  (c) 5 + (−3)  (d) 2 + (−7)
(e) −3 − 6  (f) −1 − 4  (g) −9 + 5  (h) −2 + (−5)
(i) 2 − (−4)  (j) −6 − (−3)  (k) −2 − (−4)  (l) −7 − (−7)

2 The rail distance from Manchester to Glasgow is 357km. If a high speed train averages 140 km/h, find the time taken in hours and minutes.

3 Susan Marshall is paid an hourly rate of £12.40.

She works a basic 36 hour week.
In addition any overtime she works is paid at time-and-a-half.
Calculate her total pay for a week in which she works 42 hours

4 Calculate 35% of £360.