

Mh4718 Worksheet 1

1. Express the binary number 1000111.01101 in base ten notation.
2. Express the base ten number 247.2 in base two notation.
3. Express the binary number 1.1001×10^{11} in base ten fixed point notation.
4. Write each of the following base ten numbers in normalised scientific notation:
(i) 53.892, (ii) 0.0014, (iii) 573.21×10^2 (iv) 270.159 (v) 253.1573
5. Write the base ten number $7.\dot{4}\dot{3}$ in the form $\frac{a}{b}$ where a and b are integers.
6. Write the binary number $11.1\dot{1}\dot{0}$ in the form $\frac{a}{b}$ where a and b are integers.
7. Express the hexadecimal number 1AE43 in base ten notation.
8. For each of the following base ten numbers state how many significant figures each one has and then round each one to the specified number of significant figures:
 - (a) 96,302 (round to 2 significant figures)
 - (b) 54.918 (round to 2 significant figures)
 - (c) 0.003702 (round to 3 significant figures)
 - (d) 561,045 (round to 3 significant figures)
 - (e) 8.007 (round to 1 significant figure)
 - (f) 23,654,067 (round to 5 significant figures)
 - (g) 0.030048 (round to 1 significant figure)
 - (f) 23,654,067 (round to 5 significant figures)
 - (g) 0.030048 (round to 4 significant figures)

9. Convert the following mathematical equations into valid C++ statements:

(a) $\frac{y-z}{x-y}$; (b) $y = mx + c$; (c) $x = \frac{-b+d}{2a}$; (d) $s = ut + \frac{1}{2}t^2$.

10. Assuming the following variable definitions:

```
int a = 1, b = 10, c = 5;
```

```
int d;
```

determine the value of d after each of the following statements: (a) $d = b/c + 1$;

(b) $d = b - 3 * c/5$; (c) $d = c + b/5$;

(d) $d = (c + b)/5$; (e) $d = b/2 * c$;

11. Assuming the following: `int a =12, b = 0, c =3;`

what is the value of a, b, c after each of the following statements:

```
a++;
```

```
b--;
```

```
c=c+2;
```

12. Assuming the following: `int a =1, b = 12, c =3, d;`

what is the value of a, b, c, d after each of the following statements:

```
a*=2;
```

```
d =b%5;
```

```
c+=7;
```