1.6.2 Solutions to 1.5 Homework : Harder Questions

GCSE Mathematics
Functions I

Answer 1

(i)	18	**(ii)**	– 8	**(iii)**	31
(iv)	135	**(v)**	5	**(vi)**	– 34

[3 marks]

Answer 2

(i)	3	**(ii)**	– 3	**(iii)**	– 17
(iv)	– 83	**(v)**	19	**(vi)**	33

[3 marks]

Answer 3

(i)	10	**(ii)**	1	**(iii)**	6
(iv)	7	**(v)**	9	**(vi)**	11

[3 marks]

Domain is all real numbers such that $x \leqslant 101$ because otherwise you could try to take the square root of a negative number which is not real.
It could crash your computer program, for example.

[1 mark]

Answer 4

(i)	51	**(ii)**	51	**(iii)**	101
(iv)	101	**(v)**	261	**(vi)**	261

[3 marks]

Answer 5

(i)	16	**(ii)**	58	**(iii)**	457
(iv)	6	**(v)**	238	**(vi)**	28

[3 marks]

Answer 6

(i)	14	**(ii)**	39	**(iii)**	– 1
(iv)	1110	**(v)**	155	**(vi)**	– 21

[3 marks]

Answer 7

(i)	4	**(ii)**	3	**(iii)**	1
(iv)	– 6	**(v)**	0.5	**(vi)**	48

[3 marks]

Domain is all real numbers except zero (i.e. $x \neq 0$) because otherwise you could try to divide by zero which has no meaning in mathematics. It's undefined.
A division by zero error caused a car factory robot to kill a worker in 1994.

[1 mark]

Answer 8

(i)	3	**(ii)**	6	**(iii)**	9
(iv)	12	**(v)**	1	**(vi)**	5

[3 marks]

Restriction on the domain, $x \geqslant 0$, is to avoid trying to take $\sqrt{\ }$ of a negative number.

[1 mark]

Answer 9

(i) 68 **(ii)** $\frac{5}{8}$ or 0.625 **(iii)** $\frac{1}{1000} + \frac{1}{10} = 0.101$

[3 marks]

Answer 10

(i) 5 **(ii)** 9 **(iii)** 0.5

[3 marks]

Restriction on the domain, $x \geqslant 0$, is to avoid trying to take $\sqrt{\ }$ of a negative number.

[1 mark]

Answer 11

(i) $\frac{1}{4}$ **(ii)** $\frac{1}{25}$ **(iii)** $\frac{1}{16}$

[3 marks]

Restriction on the domain, $x \neq 0$, is to avoid trying to divide by zero.

[1 mark]

Answer 12

(i) 12 **(ii)** 42 **(iii)** 132

[3 marks]

Restriction on the domain, $x \geqslant 0$, is to avoid trying to take $\sqrt{\ }$ of a negative number.

[1 mark]

Answer 13

(i) $1\frac{1}{3}$ **(ii)** $1\frac{1}{10}$ **(iii)** $\frac{9}{10}$

(iv) $1\frac{1}{5}$ **(v)** $\frac{4}{5}$ **(vi)** $\frac{99}{100}$

[3 marks]

Answer 14

(i) $z^2 + 2z + 1$ **(ii)** $z^2 + 10z + 25$ **(iii)** $4z^2 + 12z + 9$

[3 marks]

Answer 15

(i) 4 **(ii)** -2

(iii) $w^2 + 1$ **(iv)** $w^2 + w + 1$

[4 marks]

Answer 16

(i) 20 **(ii)** 12

(iii) $z^2 + 3z + 2$ **(iv)** $z^4 + 2z^3 + 2z^2 + z$

[4 marks]