

Marks are indicated in brackets after each question number

2014 Paper 2 Question 4, (1) (3) (1)

$$\text{a) i) Mean} = \frac{53 + 57 + 58 + 60 + 55 + 56}{6} = 56.5$$

$$\text{ii) Mean} = \bar{x} = 56.5$$

x	$x - \bar{x}$	$(x - \bar{x})^2$
53	-3.5	12.25
57	0.5	0.25
58	1.5	2.25
60	3.5	12.25
55	-1.5	2.25
56	-0.5	0.25
		$\sum (x - \bar{x})^2 = 29.5$

$$\text{Standard Deviation} = \sqrt{\frac{29.5}{6 - 1}} = 2.4$$

b) In the new training routine, the mean is lower and the standard deviation is higher. Since the standard deviation is higher she is now less consistent despite the fact that her average time is lower.

2015 Paper 1 Question 5, (3)

$$\bar{x} = \frac{1 + 2 + 2 + 2 + 8}{5} = 3$$

x	$x - \bar{x}$	$(x - \bar{x})^2$
1	-2	4
2	-1	1
2	-1	1
2	-1	1
8	5	25
		$\sum (x - \bar{x})^2 =$
	32	

$$\text{Standard Deviation} = \sqrt{\frac{32}{4}} = \sqrt{8}$$

$$\text{So, } \sqrt{8} = \sqrt{a}$$

$$a = 8$$

2016 Paper 2 Question 6, (4) (2)

a) Mean $= \bar{x} = \frac{13 + 16 + 10 + 22 + 5 + 12}{6} = 13$

x	$x - \bar{x}$	$(x - \bar{x})^2$
13	0	0
16	3	9
10	-3	9
22	9	81
5	-8	64
12	-1	1
		$\sum (x - \bar{x})^2 = 164$

Standard Deviation $= \sqrt{\frac{164}{5}} = 5.73$

b) The mean has increased and the standard deviation has decreased. This means that, on average, Sophie had to wait longer on the phone than Jack, but since the standard deviation has decreased her waiting times were more consistent than they were for Jack.

2017 Paper 1 Question 12, (4)

$$\bar{x} = \frac{1 + 4 + 6 + 3 + 6}{5} = 4$$

x	$x - \bar{x}$	$(x - \bar{x})^2$
1	-3	9
4	0	0
6	2	4
3	-1	1
6	2	4
		$\sum (x - \bar{x})^2 = 18$

$$\text{Standard Deviation} = \sqrt{\frac{18}{4}} = \frac{\sqrt{18}}{\sqrt{4}} = \frac{2\sqrt{3}}{2}$$

$$a = 3$$

$$b = 2$$