4 **a** $a = 1.645$ **b** $a = -1.282$

EXERCISE 29H.2

1 **a** 0.159 **b** 0.3085 **c** 0.335
2 **a** 0.348 **b** 0.324 **c** 0.685
3 **a** 0.585 **b** 0.805 **c** 0.528

EXERCISE 29H.3

1 **a** $k \doteqdot 0.878$ **b** $k \doteqdot 0.202$ **c** $k \doteqdot -0.954$
2 **a** $k \doteqdot -0.295$ **b** $k \doteqdot 1.165$ **c** $k \doteqdot -1.087$
3 **a** $\Pr(-k \leqslant z \leqslant k)$
$= \Pr(z \leqslant k) - P(z \leqslant -k)$
$= \Pr(z \leqslant k) - [1 - P(z \leqslant k)]$ {as is symmetric about O}
$= 2\Pr(z \leqslant k) - 1$
b **i** $k \doteqdot 0.303$ **ii** $k \doteqdot 1.037$

EXERCISE 29I

1 0.378 **2** 83 **3** **a** 90.4% **b** 4.78%
4 **a** 0.003 33 **b** 61.5% **c** 23
5 **a** 0.933 **b** 0.243
6 **a** $\mu = 52.4,\ \sigma = 21.6$ **b** 54.4%
7 **a** $\mu = 2.00,\ \sigma = 0.0305$ **b** 0.736
8 $\Pr(S \geqslant 70) = 0.1587$ $\Pr(G \geqslant 66) = 0.0913$ $\therefore$ only 9% achieved a higher grade in Geography while almost 16% achieved a higher grade in Science. The student did better in Geography where he/she achieved a grade higher than 91% of the class compared with a grade of higher than 84% of the class in Science.

REVIEW SET 29A

1 **a** $a = \frac{5}{9}$ **b** $\frac{4}{9}$
2 **a**

x_i	0	1	2	3	4
$P(x_i)$	0.0625	0.25	0.375	0.25	0.0625

b $\mu = 2,\ \sigma = 1$
3 $p = 0.18$, **a** 0.302 **b** 0.298 **c** 0.561
4 $p = 0.04,\ n = 120$ **a** $\mu = 4.8$ **b** $\sigma = 2.15$
5 **a** \$4 **b** \$75
6 **a** \$7 **b** No, he would lose \$1 per game in the long run
7 $\mu = 64,\ \sigma = 4$ **a** **i** 81.85% **ii** 84.1% **b** 81.85%
8 $\mu = 31.2$

REVIEW SET 29B

1 **a** $k = \frac{8}{5}$ **b** 0.975
2

x_i	0	10 000	30 000	45 000
$P(x_i)$	0.988 18	0.0088	0.0023	0.000 72

$\mu = 189.40$ $\therefore$ charges \$439.40
3 $p = 0.96$ **a** 0.849 **b** 2.56×10^{-6} **c** 0.991
d 0.000 25
5 **a** **i** 2.28% **ii** 84% **b** 0.840
6 **a** 0.260
b $k = 29.3$ $\therefore$ can expect that no more than 8% of batteries will fail in at most 37.13 weeks.

REVIEW SET 29C

1 **a** $k = 0.05$ **b** $\mu = 1.7,\ \sigma = 0.954$
2 **a** 0.259 **b** 0.337 **c** 0.922
3 $\mu = 6.43,\ \sigma = 2.52$
4 **a** $a = 6.3$ grams **b** $b = 32.3$ grams
5 $\Pr(x \leqslant 3) = 0.147$ $\therefore$ out of 2000, 294 will on average need to be replaced. Profit = \$28 530
6 **a** $\int_0^2 ax^2(2-x)\,dx = 1$ gives $a = \frac{3}{4}$
b mode occurs at the maximum of $f(x)$ and so mode is $\frac{4}{3}$
c median is 1.23
d $P(0.6 < x < 1.2) = \int_{0.6}^{1.2} \frac{3}{4}x^2(2-x)\,dx$
$= 0.3915$