Exercise 1A

- **1 a** £0.87
 - **b** £2·12
 - c No burger.
- **2 a** £40.40
 - **b** £7·40
 - **c** 32 weeks
 - d 15 weeks, 17 weeks sooner.
- **3 a** £5
 - **b** (i) £595
 - **(ii)** £450
 - **c (i)** £410
 - (ii) 13 months, rounded up.
- **4 a** £180

b

(i)	Monthly expenditure	£
	Car Ioan	120
	Petrol	120
	Car repairs/service	40
	Rent	250
	Gas/electricity	45
	Council Tax	60
	Car Insurance	75
	Entertainment	100
	Clothing	40
	Food	120
	Savings	25

- (ii) No.
- (iii) Reduce clothing to £10, Entertainment to £20. Saving £110.
- **c** Yes, £120 left after expenses.

- **5 a** £795
 - **b** £12
 - **c (i)** £54
 - (ii) £324 No.
 - (iii) Reduce monthly entertainment to 60, leaving £684 after 6 months. Cheaper holiday, check Internet prices.
- **6 a** £40.80
 - **b** £30
 - c 23 weeks, rounded up.
- **7 a** £2897·25
 - **b** £408·25
 - **c** 12 months, rounded up.
 - **a (i)** £61

8

- (ii) £51.75
- (iii) £9·25
- **b** Stop gym membership, reduce entertainment to £10.
- **9 a** £12.49
 - **b** 19 weeks, rounded.
 - **c** There may be allowances from social security for a suit. CAB may help with budgeting, Charities and credit union.
- 10 a Surplus £176
 - **b** Surplus £48.25
 - **c** Try to reduce petrol costs. Reduce cashline withdrawls and clothes spending.
- 11 a Deficit £458
 - **b** One more month (+ 2 weeks or so).
 - c Reduce cash withdrawls Gas/electricity, spend less in supermarket.
 - **d** Increase earnings by working more hours or get a new job that pays more.
- **12 a** No, deficit of 10200 fr
 - **b** 17 more
 - **c** Increase wages by working evenings or getting better paid job. Barter/haggle rather than cash.

Exercise 1B

- **1 a (i)** £2.70
 - (ii) £2·40
 - (iii) £2·30
 - **b** (i) £5·20
 - (ii) £4·40
 - (iii) £3·90
- **2 a** £252
 - **b** No. lose £18.
 - **c** Sell unsold remainder at cheaper price.
- **3** £97
- **4** £43

5

Music festival expenditure	£
Ticket (covers Friday, Saturday, Sunday)	193.95
Camping @ £4·50 per night for 4 nights (Thurs–Sun)	18.00
Food and drink: £20 per day for 4 days (Thurs–Sun)	80.00
Breakfast on Monday	5.00
Bus journey: £5.50 each way	11.00
Tent	23.00
Sleeping bag	12.50
Total	343.45

- **a** £343·45
- **b** No, £3.45 short.

- 6 £5 rounded up.
- **7 a** £4080

b

Expenditure	£
Use of hall	75
Props	165
Scenery	265
Costumes	552
Sound	260
Lights	350
Royalties	612
Printing	28
Total	2307

- **c** £1173
- **8 a** £608.63
 - **b** £7·17
- **9** a £125.77
 - **b** (i) £0.32
 - (ii) £0·57

Activity

1. Exercise for student

2. a

	aug	sep	oct	nov	dec	jan
income						
allowance	20	20	20	24	24	24
birthday	30	0	0	0	40	0
other	4.5	0	8	0	7.45	0
carried	0	- 38.31	- 51.03	- 28.19	- 18.48	38.48
to inc	54.5	- 18.31	- 23.03	- 4.19	52.97	62.48
exp						
choc	1.2	0	0	0	0	0.6
download	9.99	0	0	0	0	0
cd	7	0	0	7	0	0
jeans	39.99	0	0	0	0	0
t shirt	9.99	0	0	0	0	0
bag	0	10	0	0	0	0
tablet comp	0	0	0	0	0	0
cinema	6	0	0	6	0	0
popcorn	0	0	0	0	5.5	0
crips	0	1.29	5.16	1.29	0	0
juice	1.15	3.45	0	0	0	0
bicycle	0	0	0	0	0	0
pizza (medium)	8.99	17.98	0	0	8.99	0
burger	8.5	0	0	0	0	0
tot exp	92.81	32.72	5.16	14.29	14.49	0.6
	- 38.31	- 51.03	- 28.19	- 18.48	38.48	61.88

b

Aug = - £31.31Sep = - £51.03Oct = - £28.19Nov = - £18.48Dec = £38.48 Jan = £61.88 С

 $\pounds 61.88 - \pounds 40 = \pounds 21.88$

d Exercise for student

Chapter 2				2	a	£9888
Ex	erci	ise 1	A		b	£1977·60
1	a	(i)	£2625	3	а	£16125
		(ii)	£2137·5		b	£3225
	b	(i)	£134·80		С	£24400
		(ii)	£4897·30	4	а	£26200
2	а	£73)		b	£5240
	b	£87	50	5	а	£10900
3	a	£37	28.40		b	£2180
	b	£13	062		С	£181·67
	с	£93	33.60	6	а	£20430
4	a	£60	2:70		b	£4086
	b	£63	5.40		С	£340·50
5	£26	528·8	5	7	a	£37088
6	а	£114	40		b	£8435·20
-	b	(i)	£5505	8	a	£46345
		(ii)	Unlikely to sell 4 paintings per		b	£12138
		()	month.		С	£1011.50
7	a	43		9	a	£53116
	b	£222	2.07		b	£14846·50
8	a	(i)	£3706·80		С	£1237·20
		(ii)	65·3%	10	a	£171050
	b	£52	314		b	£63072·50
9	a	£114	475000	11	a	£3 438 500
	b	£36	30		b	£1 533 425
10	a	£11	036.81		С	£127785·42
	b	9.2%	0	12	a	£205350
11	a	£23	48		b	£193850
	b	£13.	5.20		С	£73332·50
12	a	£18	5-11	13	a	£13650
	b	(i)	£265·92		b	£2150
		(ii)	42.9%		С	£430
Ex	erci	ise 2	В		d	£0, tax allowance higher than annual wage
1	a	£17	943	14	а	(i) £20218
	b	£35	38.60		••	(ii) f4043.60
						,

b 12.7%

Ex	erc	ise 2C	Ex	erc	ise 2	D
1	a	£1018·80	1	a	£36.	5.3
	b	£1862·88		b	£52-	39
	С	£1593·24		С	£312	2.9
	d	£5567·88	2	а	£24	10.
	e	£5149·26		b	£67	1.7
	f	£0		С	£173	38.
2	a	£93·91		d	6%	
	b	£29·62	3	а	£348	8.0
	С	£60·10		b	£28	11.
	d	£18·12		С	70.1	%
3	£1	2.74	4	а	£20	09.
4	а	£1096·44		b	(i)	£
	b	£91·37			(ii)	£
5	£2	93			(iii)	£
6	£2	2824		С	(i)	£

7 a £3486.60

e

b (i) £3665·23 (ii) £178.63

- 32
 - 93
- ·58
 - 70
 - ·88
-)9
- ·72
- ·30
 - 12612
 - 2522.40
 - 210.20
 - 1914.24
 - (ii) £159.52
 - **d** £110.47

Basic pay £2009·30	Income tax £210·20	
	National insurance £159.52	
	Pension £110·45	
Gross pay £2009·30	Total deductions £480·17	Net pay £1529·13

5 a £235.50

e

c £9·42 **d** £9.42

b (i) £12246

(ii) £746

(iii) £149·20

Basic pay £235.50 Income tax £2.87 National insurance £9.42 Pension £9.42 Gross pay £235.50 Total deductions £21.71 Net pay £213.79 e

6	а	(i)	35 hours			(iii)	£1058
		(ii)	£367.50			(iv)	£20·35
	b	(i)	£19110		С	£25•	26
		(ii)	£5290		d	£20•	21

Basic pay £367.50	Income tax £20·35	
	National insurance £25.26	
	Pension £20·21	
Gross pay £367.50	Total deductions £65.82	Net pay £301.68

- **7 a** £283333.33
 - **b** (i) £3 438 500
 - (ii) £1 533 425
 - (iii) £127785·42

e	Basic pay £283333.33	Income tax £127785.42	
		National insurance £5960.07	
		Pension £4250.00	
	Gross pay £283333.33	Total deductions £137995.49	Net pay £145337.84

c (i) £71520.80

d £4250

4 a fixed

(ii) £5960·07

f 51.2%

Activity

1	а	£25(00			rent	600
-	h	(i)	£20000			council	200
	U	(i) (ii)	£4000			gas + electricity	100
		(iii)	£333·33			phone travel	40 240
2	а	(i)	£2645·28			TV	15
		(ii)	£220·44		variable		
	b	£125	5			supermarket	300
3	а	£250	00			clothes	60
	b	£678	8.77			going out	50
	С	£182	21.23			other	30
						savings	25

total exp 1660

- **4 b** 2 bedroom flat 600 already included
 - **c** fixed

rent	600
council	100
gas + electricity	80
phone	40
travel	240
TV	15
supermarket	300
clothes	60
going out	50
other	30
savings	25
	1540
	rent council gas + electricity phone travel TV supermarket clothes going out other savings

4 d 2 bedroom flat, new car = 250

fixed		
	rent	600
	council	100
	gas + electricity	80
	phone	40
	travel	250
	TV	15
variable		
	supermarket	300
	clothes	60
	going out	50
	other	30
	savings	25
total exp		1550

5 Supermarket £300

6	internet	15
	clothes	40
	tv	16
	meals out	25
	cinema	7
	dvd	8
	games	27
	tot =	138

adjust main table:

fixed		
	rent	600
	council	100
	gas + electricity	80
	phone	40
	travel	250
	TV	16
variable		
	supermarket	300
	clothes	40
	going out	25
	other + games	57
	savings	25
	cinema + dvd	15
total exp		1548

7 a savings = 1821 - 1548 = 273

b Table works

c Exercise for student

Exercise 3A

- **1 a** Bristol Hotel Brunel + Bristol Science centre and Bristol SS GB and Bristol Travel = $\pounds 213.85$
 - **b** (i) No, cost is £313.60
 - (ii) Change to Hotel Seattle.
- **2 a** Everyday, £15.93
 - b (i) Everyday chicken £6·89 Everyday olive oil £1·25 Albertson Onion £0·32 Alberstons mushroom £0·54 Everyday tomato puree £0·46 Everyday wine £3·75 Festival consomme £1·68 Everyday tomato £0·56
 - (ii) Everyday = ± 12.91 Albertson = ± 0.86 Festival = ± 1.68
 - (iii) £15·45
 - (iv) 97%
- **3** For 7 nights.
 - **a** £949·16
 - **b** £1536.92
 - c £1277·26, staying at Hotel Maris
- **d** Nearest to £650 each is Belle Air (out), Fly Away (return), Hotel Melia full board and 7 days insurance. Cost £647·31.
- **4 a** £429
 - b Closecall UK, £406·40
 - c Wireless £510
 - Frontier £448.80
 - Comcast £440·40
 - Matrix £388·20
 - Closecall £389.40
 - Matrix cheapest second year.
 - d Closecall UK

- **5 a** £470·15
 - **b** £730·40
- **6 a (i)** A £620.87
 - B £844·99
 - C £1793·99
 - D £780
 - E £624

Company E is one of the cheapest and has generous allowances

- **b** (i) Company D is best value
 - (ii) Company E is best value
- **7 a (i)** £166·40
 - (ii) £167·08
 - (iii) £173·22
 - (iv) £189.80
 - **b** Saturday Matinee, rear stalls, 3 course lunch with drinks, 4 packets of chocolate sweets £248.26
- 8 a Cost is £11082 which is greater than his budget of £10800
 - **b** deluxe 5 white, LED, Entertainment = ± 10782
- **9 a (i)** £209·99
 - (ii) £215·50
 - **b** £287.99
 - c Stainless Steel frame + varifocal + black case = ± 169.99

Exercise 4A

- 1 a 134168 J.Yen , 61362 Rupee, 1790 A.Doll
 - **b** £271.05
- **2 a** €336·20
 - **b** CHF 974·40
 - **c** €404·20
 - **d** £277·85, £658·38, £334·05, £1270·28

3 a (i) £18⋅09

- (ii) 26.64 A.Doll
- (iii) 2925 J.Yen
- (iv) 25.51 Euro
- (v) 214.90 Rand
- **b** (i) £18.09, £14.88, £17.44, £21.08, £12.89
 - (ii) Cape Town cheapest
 - (iii) £8·19
- **c** Local wages, cost of living, cost of resources.
- **4 a** 195, 206·59, 190·49, 198·41, 212·57
 - **b** India cheapest.
- **5 a** 123649.05 J.Yen
 - **b** 127417.50 J.Yen
 - c Bank better. More Yen.
 - **a** 9981.99 R

6

- **b** 10026 R
- **c** 9882·36 R
- d (i) Bank. Most Rand
 - (ii) Bureau. Least Rand
- **7 a** 355.02 Euro, 646.02 Lira
 - **b** 356·40 Euro, 651·42 Lira
 - **c** TA2 is best.

8 a (i) £8.15

- (ii) 654.64 Dollars
- **b** £6
- c John paid £8·16, Amir £6
- **d** John could choose better exchange rate or less commision. Amir use bank before leaving.

- **9 a (i)** 638.6, 619.6, 603.48, 612.44, 611.64, 618.64, 606.76
 - (ii) \$35·12
 - (iii) 5·82%
 - **b** (i) 608.6, 600.56, 583.52, 590.28, 617.40, 656.44, 662.96
 - (ii) 79·44
 - **(iii)** 13.61%
 - **c** Australian Dollars varied more
- **10 a** 2088
 - **b** 535.36
- **11 a** 609
 - **b** 360
 - **c** (i) 447.5, 435, 302.5, 41927.5, 370, 410
 - (ii) 236·77, 240·33, 242, 237·2, 240·26, 239·77
 - (iii) least return = most agency profit Australian dollar.
- **12 a** 8.80
 - **b** 1605
 - **c** 4.96
 - d Dip on Tuesday but steady thereafter.
 - e (i) High
 - (ii) Low
- **13 a (i)** 1586·36
 - (ii) 2010·21
 - **b** France. Cheaper shipping, more expensive cost in Norway.
- **14 a** Bureau euros = 343.98
 - Bureau Frank = 560.56
 - Bank euros = $342 \cdot 20$
 - Bank Frank = 556.95
 - Travel Agent euro = 341.55
 - Travel Agent Frank = 547.86
 - Superm euro = $346 \cdot 32$
 - Superm Frank = $562 \cdot 32$
 - ATM euro = 345.97
 - ATMFrank = 561.53
 - **b** Supermarket

- **15 a** 734, 3105, 3222
 - **b** 3475.53
 - **c** £78·30
- **16 a** 710
 - **b** 70.79
 - c No: bus would cost £130 but they have £53.62
- **17** £207·11
- **18** 9·13
- **19** Loss. Sold for equivalent of €538 597.56
- Activity exercise for student

Exercise 5A

- **1 a** (i) £841.76, £612.52, £497.90
 - (ii) £229·24
 - (iii) £7394·24
 - **b** £593.96
- 2 a Appliances R US
 - **b** Appliances R US
 - **c** Electroworld
- 3 May offers a better deal as April repayments are £738 and May repayments are £669.45.
- **4 a (i)** 3.18%
 - **(ii)** 4.679%
 - **b** Smaller loans less profitable for lender so increase charges.
- **5 a** £104.77
 - **b** £106.66
- **6 a** £926.04
 - **b** £3137.06
- **7 a** £118·13
 - **b** £12.87
- **8 a** £14627
 - **b** £1222.67
 - c (i) Bank or credit union.
 - (ii) Bank won't lend.
- **9** £29·18
- **10 a** Option 1 £819·52; Option 2 £440·82; Option 3 £314·58
 - **b** £520
- **11** D2
- **12 a** £56·83, £133·65, £257·92
 - **b** (i) Each pay £133.65, combined = £267.30
 - (ii) £9·38
 - (iii) £9·37

Exercise 5B

- **1 a** £52.84
 - **b** £78·45
 - c Store card cheaper
 - **d** £15·41
- **2** £2953·26
- **3** £143·35
- **4 a** 540
 - **b** £93·43
 - **c** £110.15
- 5 £399·39
- **6 a** £66.63
 - **b** 23.65%
- **7 a** £203·31
 - **b** Yes, cost is £183.55
- **8 a** 20.8%
 - **b** Store card cheaper, £205.77
- **9** £258·11
- **10 a** £460.94
 - **b** 40.1%
- **11** 29·54%
- **12 a (i)** £4134
 - (ii) £344·50
 - **b** (i) £4566
 - (ii) £36

Exercise 5C

- **1 a** £3727.58
 - **b** £4576·10
 - **c** £6507.00
 - **d** £9394·92
 - **e** £1288·49
 - **f** £9294·26
- **2 a** £4192.74
 - **b** £5964.04
 - **c** £7278·25
 - **d** £1772.85
- **3** 7

4	£54	459.94			18	f8	5.88	f3 321.02
5	£30	042.95			10	10 10	2.02	£3,321.02
6	а	£8844·06			20	£8	0.10	£3,204.05
	b	£8903·86			20	£0	7.10	£2,004 15
	с	Variable slightly	higher.		27	£7	4·03	f2 835.29
7	а	f6757·59	0		23	£7	0.88	f2 706·17
-	h	£6938.51			24		7·65	£2.573.82
	0	Eived clightly bot	tor		25	±6	4·35	£2,438·17
0	c	Edinburgh (225	00		26		0.95	£2,299·12
0	d		92		27	£5	7.48	£2,156.60
		Lothian: £211.20)		28	£5	3.91	£2,010·51
		Thistle: £224			29	£5	0.26	£1,860·78
	b	Edinburgh			30	£4	6.52	£1,707·30
9	а	£457·97, £3957·	97		31	£4	2.68	£1,549·98
	b	13.08%			32	£3	8·75	£1,388.73
Ac	tivi	itv			33	£3	4.72	£1,223·45
1	2 k	, , , , , , , , , , , , , , , , , , , ,	adshaat		34	£3	0.59	£1,054·03
•	a, 1	, c, u, e, see spier	ausneet		35	£2	6.35	£880·38
Μ	onth	n interest	balance		36	£2	2.01	£702·39
	0		£5,000·00		37	£1	7.56	£519·95
	1	£125.00	£4,925·00		38	£1	3.00	£332·95
	2	£123·13	£4,848·13		39	£	8·32	£141·28
	3	£121·20	£4,769·33		40	£	3.53	-£55·19
	4	£119·23	£4,688·56		f	40 n	nonths	
	5	£117·21	£4,605·78		σ	(i)	46 mor	oths
	6	£115·14	£4,520·92		8	(ii)	36 mor	othe
	7	£113·02	£4,433·94			(11)	20 mor	iuis
	8	£110·85	£4,344·79			(III) (')	29 1101	iths [original interest rate
	9	£108.62	£4,253·41	0		(IV)	49 mor	iths loriginal interest rate
	10	£106·34	£4,159·75	2	£6.	555		
	11	£103.99	£4,063·/4	3	а	A: £	173.92	
	12	£101.59	£3,965·33			B: £	186.59	
	13	£99·13	£3,864·4/			C: £	156.22	
	14	£96.61	£3,/61·08		b	£30•	37	
	15	±94·03	$\pm 3,055.11$	4	a	£802	2 955 30)7
	10	191.30	±3,546·48		b	1 33	8 258.8	%
	17	700.00	±3,435.15					

Exercise 6A

1 a very unlikely

- **b** even chance
- **c** very unlikely
- **d** certain
- e very unlikely
- f impossible
- **g** very likely
- **h** impossible
- i unlikely
- **2 a** $\frac{3}{10}$
 - **b** $\frac{1}{10}$
 - **c** $\frac{3}{10}$
 - **d** 0
- **3 a** $\frac{1}{13}$
 - **b** $\frac{3}{4}$
 - **c** $\frac{1}{26}$
 - d $\frac{1}{2}$
 - **e** $\frac{2}{13}$

4

- f $\frac{1}{26}$
- a (i)
 - (ii) $\frac{1}{6}$

 $\frac{1}{3}$

- (iii) $\frac{2}{3}$
- (**iv**) 1
- **b** 36
- **5** Sharon: $\frac{1}{2}$, Chris: $\frac{1}{3}$. Sharon.
- **6 a** $\frac{33}{172}$
 - **b** $\frac{13}{86}$
 - **c** Young wage earners, drinking culture, no family to support.
- **7** a $\frac{559}{1087}$
 - **b** $\frac{21}{1087}$
 - **c** $\frac{431}{1087}$
 - **d** More active life-style, risk takers.
- **8 a** 1265200
 - **b** (i) 1825
 - (ii) 1095
 - **c (i)** 70560
 - (ii) 24 500

- **d** Advertising and GP advice.
- **9 a (i)** $\frac{23}{57}$
 - (ii) $\frac{34}{57}$
 - **b** (i) 3.23
 - **(ii)** 4.77
 - **c** Christmas extra bills.
- **10 a** (i) $\frac{19}{261}$
 - (ii) $\frac{5}{87}$
 - (iii) $\frac{19}{302}$
 - **b** (i) 3.2
 - **(ii)** 2.53
 - (iii) 2·83
- **c** Gold expected, silver better than expected, bronze better than expected.
- **11 a** (i) $\frac{7}{244}$
 - (ii) $\frac{341}{3050000}$
 - **b** (i) 206,557,377
 - (ii) 804,984
 - **c** Contracting expected. Deaths reduced from expected better treatment/ prevention/education.

Exercise 6B



b	(i)	$\frac{1}{8}$
	(ii)	$\frac{3}{8}$
	(iii)	$\frac{7}{8}$
С	(i)	0.125
	(ii)	0.375
	(iii)	0.875



Exercise 6C

- **1** a $\frac{199}{857}$
 - **b** $\frac{218}{857}$
 - **c** 1170
 - **d** (i) safer vehicles, better education, less journeys made due to rising fuel costs
 - (ii) lower speed, drive daytime, seatbelts required before car start.
- **2 a** 0.042
 - **b** 0.38
 - **c** Carelessness, not professionals, unaware of risks.
- **3 a** 0.53
 - **b** 0.996
 - **c** Fewer chimneys.
 - **d** (i) more fire doors, better alarms, sprinklers
 - (ii) warnings, education
- **4 a** 0.46
 - **b** 0.56
 - **c** so effectiveness can be compared to baseline of no medication.
- **5 a (i)** 0.823
 - (ii) 0·825
 - (iii) 0·831

2

- **b** 0.174
- c Drug 3; fewer side effects.
- **d** How bad are side effects. How good are three drugs at "killing germs"
- **6 a** 182
 - **b** (i) 0.0000045
 - (ii) Yes, fewer than expected.
 - **c (i)** 11
 - (ii) No, 22 is double expected.
 - **d** Advertising, education/training, inspections.
 - **a (i)** 9030
 - **(ii)** 2795
 - **b** 17630

7

- **c** 0.004
- **d** (i) 0.026
 - (ii) Gymnastics less likely, lower risk
- e More training for coaches, more care.

Exercise 6D

- **1** A tripping on rocky path
 - B excessive drinking alcohol
 - C Motorcycling in dark in winter
 - D cycling on dry cycle path
 - E Attacked by a shark

what has pot to cause harm	who and how many	measures in place	severity	likelihood	risk rating
fall downstairs	pupil (15) + teach (2)	common sense instruction	3	2	М
bus crash	pupil (15) + teach (2)	good bus company	3	1	L
heart attack	pupil (15) + teach (2)	H & S staff training	4	1	L
lost	pupil (15)	instructions to pupils + maps	2	2	L

3 a

what has pot to cause harm	who and how many	measures in place	severity	likelihood	risk rating
injury on pitch	pupil (15)	pitch safety team	2	3	Н
bus crash	pupil (15) + teach (2)	good bus company	3	1	М
heart attack	pupil (15) + teach (2)	H & S staff training	4	1	М
lost	pupil (15)	instructions to pupils + maps	2	1	L

b

what has pot to cause harm	who and how many	who and how many measures in place		likelihood	risk rating
injury on court	pupil (15)	safety team	2	2	L
bus crash	pupil (15) + teach (2)	good bus company	3	1	м
heart attack	pupil (15) + teach (2)	H & S staff training	4	1	М
lost	pupil (15)	instructions to pupils + maps	2	1	L

С

what has pot to cause harm	who and how many	measures in place	severity	likelihood	risk rating
injury (eye, limb, head)	pupil (100) staff (10)	safety team	3	2	Н
bus crash	pupil (100) + staff (10)	good bus company	3	1	М
heart attack	pupil (100) + staff (10)	H & S staff training	4	1	М
lost	pupil (100)	instructions to pupils + maps	2	1	L

4

what has pot to cause harm	who and how many	measures in place	severity	likelihood	risk rating
injury (fall, eye, head)	pupil (15) + teach (2)	safety team in train- ing	3	2	Н
bus crash	pupil (15) + teach (2)	good bus company	3	1	L
heart attack	pupil (15) + teach (2)	H & S staff training	4	1	м
lost	pupil (15)	instructions to pupils + maps	4	2	Н

Exercise 7A [s.d. to 1dp]

- **1 a** 8, 2.6
 - **b** 19, 3·1
 - **c** 11, 2.6
 - **d** 34.5, 10.1
- **2 a** 24, 8.7
 - **b** 22,14.7
 - **c** 1.94, 0.2
 - **a (i)** £33

3

- (ii) £9·21
- **b** (i) £34.50
 - (ii) £9·21
- **4 a (i)** £28000
 - (ii) £10124·20
 - **b** (i) £30000
 - (ii) £10124·20
- **5 a** 0, 2.6
 - **b** 2, 2.8
 - **c** Average temp higher in London, but wider variation in London.
- **6 a** 27, 10.7
 - **b** 9, 3.5
 - **c** Men have fewer shoes. Variation much higher in women group.
- **7 a** 9 mins, 2.9 mins
 - **b** 22mins, 13.9mins
 - **c** Fast food much quicker and much less variation.
- **8 a** 118kg, 18kg
 - **b** 99kg, 6kg
 - c Males heavier and greater variation.
 - **d** Yang Guang much heavier than average, TianTian about average.
- **9 a** 17mm, 9·7mm
 - **b** 12mm, 5·7mm
 - c Dorset wetter with greater variation.
- **10 a** 100, 2
 - **b** Not quite: s.d. = 2 but claim is < 2.

- **11 a** 76, 2.8
 - **b** 76, 5
 - **c** Average is identical but Gordon has higher variation [less consistent].

Exercise 7B

- **1 a** 6, 3, 6, 8, 5
 - **b** 38.5, 29, 38.5, 46.5, 17.5
 - **c** 5·3, 2·95, 5·3, 7·8, 4·85
- 2 measurements in cm
 - **a (i)** 135
 - (ii) 124, 135, 165
 - (**iii**) 41
 - **b** (i) 42
 - (ii) 38, 42, 52
 - **(iii)** 14
 - **c** Indian ears very much smaller and less variation.
- 3 measurements in £
 - **a (i)** 149000
 - (ii) 128000, 149000, 163000
 - **(iii)** 35000
 - **b** (i) 118000
 - (ii) 99000, 118000, 136000
 - (iii) 37000
 - **c** Glagow generally cheaper by about 30 000, and slightly greater variation.
- **4 a (i)** 28
 - (ii) 24, 28, 34
 - (iii) 10
 - **b** (i) 32
 - (ii) 27, 32, 38
 - (iii) 11
 - **c** After training: increased average and similar variation.
- **5 a (i)** 18.5
 - (ii) 17, 18·5, 20
 - **(iii)** 3
 - **b** (i) 8.5
 - (ii) 6, 8·5, 13
 - **(iii)** 7
 - c fewer in November, greater variation.
 - **d** In November close several rooms, reduce costs.

- 6 a (i) 84·4
 (ii) 74·5, 84·4, 91·7
 (iii) 17·2
 b (i) 85·2
 (ii) 75·1, 85·2, 92·6
 (iii) 17·5
 - **c** Mexican average slightly higher and slightly greater variation.
- 7 Measurements in £
 - **a (i)** 2631
 - (ii) 2286, 2631, 2880
 - (iii) 594
 - **b** Georgia median is cheaper but has greater variation.
- **8 a (i)** 60
 - (ii) 33, 60, 76·5
 - **(iii)** 43.5
 - **b** (i) 88
 - (ii) 43·5
 - **c** (i) 100, 45
 - (ii) Range much more affected than IQR.
- **9 a (i)** 9701.5
 - (ii) 8928.5, 9701.5, 10730.5
 - (iii) 901
 - **b** (i) 10587
 - (ii) 10125, 10587, 11595.5
 - (iii) 735·25
 - **c** Sport is more popular; higher average and less variation.
- 10 Calculations/measurements in Euros.
 - **a** (i) 2·1
 - (ii) 1.825, 2.1, 2.65
 - (iii) 0·4125
 - **b** (i) 1.9
 - (ii) 1.75, 1.9, 2
 - (iii) 0·125
 - **c** Cheaper in Spain and much less variation.

Exercise 7C

- **1 a** low = 3, Q1 = 8, Q2 = 12, Q3 = 16.5, median = 12, high = 21, IQR = 8.5
 - **b** low = 15, Q1 = 19, Q2 = 23, Q3 = 27, median = 23, high = 33, IQR = 8
 - c low = 21, Q1 = 25, Q2 = 28, Q3 = 33, median = 28, high = 38, IQR = 8
 - **d** low = 101, Q1 = 105, Q2 = 111.5, Q3 = 118, median = 111.5, high = 123, IQR = 13
- 2 a



- **b** Much wider range in students. On average pensioners better.
- 3 a



b Men wider range and on average higher. IQR greater.

a

4



b C most effective. C has greater IQR and much higher median.

5 a



- **b** Spanish tempertures are generally higher, greater IQR.
- 6 a Friday lowest = 27, Q1 = 36, Q2 = 46, Q3 = 51, highest = 61
 Saturday lowest = 21, Q1 = 29, Q2 = 43, Q3 = 60, highest = 78, SIQR = 15.5
 - **b** 7.5, 15.5
 - c Median Friday time was slightly higher. Saturday SIQR greater.
- 7 Although Dr Ball has a higher median waiting time (7 mins vs 5 mins), there are much less extremes. Dr Ball is best as you are never waiting longer than 10 minutes.
- 8 Town A has greater extremes in temp but median is much lower. Town B better for holiday.
- 9 a Race 1 lowest = 20, Q1 = 28, Q2 = 38, Q3 = 52, high = 70
 Race 2 lowest = 24, Q1 = 32, Q2 = 38, Q3 = 44, high = 58
 - **b** 24, 12
 - **c** Race 1 is 10k; unlikely to have older runners on longer race.
 - **d** Median is same, IQR much larger for R1.
- **10 a** USA median = 26, SIQR = 12 Italy median = 22, SIQR = 8
 - **b** Italy has less variation.
- **11** Dasa is fastest, Chiara second fastest based on median. Extreme times are unreliable guide.
- **12** Median temp for Bude is higher. Bude has greater extremes. SIQR for Toruay is slightly larger.

Exercise 7D

- **1 a (i)** 927575, 658054
 - (ii) 764895, 794582
 - **b** (i) 2567764·1, 4380913·8
 - (ii) 900870, 1734878
 - c (i) greatly increased
 - (ii) median similar, IQR ~ doubled
 - (iii) standard deviation.

- **2 a (i)** £34000
 - (ii) £28000
 - (iii) £20000
 - (iv) £24233·24
 - (v) £29 500
 - **b** (i) £36040
 - (ii) £29680
 - (iii) £21200
 - (iv) £25687·24
 - (v) £31270
 - (i) £35500

С

- (ii) £29500
- (iii) £21500
- (iv) £24233·24
- (v) £29500
- **d** (i) 6%
 - (ii) 6%
- e median, IQR
- **f** Less money for him personally.
- **3 a** Key: Steve, Alison, Albert, Brian Charlton: David, Pete, Julie, Hannah
 - **b** Key: 7·94Charlton: 10·31Keyteam has less variation.
 - c Key: Alison, Ann, Holly, Brian Charlton: Hannah, Pete, Barbara, Julie
 - **d** Slightly different, chosen outliers.
 - e Key: 31 Charlton: 25·5
 - f Key prefer mean, greater total weight. Charlton prefer median.
- **4 a** (i) P1: mean = 62, sd = 15.48 P2: mean = 63, sd = 12.79
 - (ii) Papers similar mean, slightly higher variation in P1.
 - (iii) 4, 4

- **b** (i) P1: median = 61.5, IQR = 16 P2: median = 61.5, IQR = 19
 - (ii) Same median, larger quartile spread in P2.
 - (iii) Paper 1 5; Paper 2 5
- c Median and IQR; results closest.
- **d** P1 shows lowest spread for IQR. P2 shows lowest spread for sd.
- 5 **a** tango = 6.8, Salsa = 6.2, Ballroom = 6.4. Salsa lowest so Kath correct.
 - **b** Tango = 6, Salsa = 6, Ball = 8. Kath not correct.
 - **c** Tango = $2 \cdot 28$, Salsa = $2 \cdot 05$, Ballroom = $2 \cdot 19$. Salsa has most consistent marks.
 - **d** Not enough data to provide good spread.

Activity measurements in cm

- 1 Height: mean = 168, Median = 169, sd = 7.32, IQR = 11hand: mean = 19.84, median = 19.85, sd = 1.58, IQR = 3shoe: mean = 9.7, median = 9.5, sd = 1.34, IQR = 2arm: mean = 157.9, median = 158, sd = 7.58, IQR = 13
- 2 Exercise for student
- 3 Exercise for student
- 4 Exercise for student

Exercise 8A

2

- 1 a positive more alcohol , slower reaction times
 - **b** negative the older you are the less alcohol you drink
 - **c** none temperature does not influence car speed on M1
 - **d** positive the older you are, the more money you save
 - **a** (i) Rhona: D, Haider: A, Jim: B.
 - (ii) Car has high mileage and is old.
 - **b** higher mileage relates to lower value.



b positive correlation, consistency between judges.



- **b** negative correlation, as age gets higher, sleep reduces.
- c see a

7

d 14.45 hours.



- **b** positive correlation. As reading speed increases, IQ increases.
- c see a











e ice cream positive correlation, umbrella negative correlation, newpapers extremely weak negative correlaion [virtually zero]



b Ice cream cost falls as distance from Vatican rises.



d costs for both increase with proximity to Vatican. Gain as much tourist revenue as possible.



- **b** see a
- **c** 1.74 m
- **d** 18·1 years; 2·2 m is unlikely height for 18 year old. Height cannot increase indefinitely.



f under 18 graph is good correlation, increase age – height. Over 18 is poor correlation, and negative.



d Life expectancy in Western Europe increases as GDP increases as shown by the positive correlation whereas there is no correlation between GDP and life expectancy in Africa.





c Revision class results are higher therefore they are effective revision class results are higher.



c pulse has fallen after club, men are fitter. Activity – exercise for student

Exercise 9A



b May results slightly higher.



c 141

2

3

d No; 121 is closer.

	Walk	Cycle	Bus	car
Воу	8	5	3	7
Girl	3	2	10	4

4

	В	oys				Girls		
				10	2			
				11				
				12	6			
				13	3	3	7	8
				14	1	3	4	6
		6	5	15	1	2	4	7
	3	1	0	16	2			
6	4	3	2	17				
	7	7	6	18				
			1	19				

Boys "higher" than girls.



Exercise 9B

- 1 a August
 - **b** Turkey rising to July then stabilising. Scotland rising to July then starting to fall.
 - **c** Turkey: $100^{0}F$ Scotland: $65^{0}F$

- 2 a Marrakesh
 - **b** Moscow
 - **c** Only very roughly, not for Moscow.
- **3 a** 15
 - **b** (i) 37
 - **(ii)** 25
 - **(iii)** 42



- **d** Yes
- **4 a** 1750000 litres
 - **b** semi increasing, whole decreasing.
 - **c** semi: 4.52, whole: 0.25
 - semi: 0.299x 597.2, whole: 348.63 - 0.173x
- 5 The sandwich provides less fat, carbohydrate and fibre for 1/4 of her daily intake of nutrients. It is also high in protein and salt. She will have to balance this with the rest of the food she eats that day.

Exercise 10A

- **1** 21*m/s*
- **2** 364
- **3** $22 \cdot 5 \, cm^2$

Activity

- **4 a** 3 g/cm³
 - **b** 755 kg/m³
- **5** 208 km/hr
- 6 12 kPa
- 7 First is fake.
- **8** 29

	volume (cm³)	density (g/cm³)	cost per gram (p)	cost (p)	sell =2 X cost (£)
candlestick brass	6	8.5	29	1479	29.58
statue iron	15	7.2	83	8964	179-28
ring gold	0.5	19.3	1658	15999.7	319.99
tankard steel	4	7.5	33	990	19.80
jug silver	3	10.4	80	2496	49.92
plate copper	7	8.9	22	1370.6	27.41

Exercise 10B

- **1 a** 525*g*, 450*ml*
 - **b** butter = 60g **cookies=** 210g **leaves=** 6 **peanut** butter = 210g **syrup** = 210g **milk** = 180ml **cream** = 324ml **brown** sugar = 2.4 tbsp **peanut** brittle=1.2 bar
- **2 a** 400*ml*
 - **b** 90*ml*
 - **c** Yes
- **3 a** 27
 - **b** 255*g*
- **4 a** 23·37
 - **b** 15.57
- 5 No

6 0.95 kg

- 7 Assuming linear interpolation
 - **a** 56.25*ft*
 - **b** 100.8*ft*
 - **c** 382·2*ft*
- **8 a** 8*m*
 - **b** 57 m
 - **c** 79.7 *m*
- **9** yes, 497 m

10

China= 142 per km² India=377 per km² USA=33 per km² Indonesia=129 per km² Brazil=24 per km² Pakistan=231 per km² Nigeria=188 per km² Bangladesh=1040 per km² Russia=8 per km² Japan=337 per km²

- **11** 910800
- **12** 81250 km²
- **13** £16.95 if emulsion, £59.92 if gloss
- **14 a** 6
 - **b** £71.94
- **15** 53.7 *m*², £1717.86
- **16 a** £107.91
 - **b** £87·12

Activity

1

tiles = $\pounds 273.38$ plain carpet= $\pounds 293.10$ luxury carpet = $\pounds 425.34$ beech wood = $\pounds 608.03$ oak wood = $\pounds 657.73$ ceramic = $\pounds 562.98$

2

Yes, luxury carpet

- 3 ceramic more durable than carpet or wood. Wood more durable than carpet.
- 4 Recommend she pay a bit more for beech wood.

Exercise 11A











5·2cm

В



- **6 a** 19 km
 - **b** 8.6 km
- 7 12 hrs 18 mins
- 8 Yes, approx 440 m so 29 minutes
- **9 a** 48 cm by 75 cm
 - **b** 201 cm
 - **c** $3 \cdot 1 m^2$
- **10** 1 cm: 40 m.
- **11 a** 1 cm: 100 m
 - **b** 535 m
- **12 a (i)** 23 km
 - (**ii)** 66∙5 km
 - **b** (i) 23 hours
 - (ii) 5pm on third day.
- **13 a (i)** 190 km
 - (ii) 150 km
 - (iii) 150 km
 - **b** Yes. Journey = 574 km, range = 3600 km
 - **c** 3 min 30 sec approximately.

Exercise 11C



b 80 m, 610 m.



40 m.



110 m.

7 a,b,c

6



Activity - exercise for student

Exercise 12A

- **1 a** 4.24 *km* at 149°
 - **b** 329°

2

- **c** 2.1 *km* at 299°
- **a** 1.15 km, 123°
- **b** $0.5 \, km, \, 42^{\circ}$
- **3** 4 km, 259° 6.6 km, 206°

4 start – A: $408m, 95^{\circ}$

- A B: 515*m*,148°
- B C: 468*m*,37° C – D: 936*m*,242°
- D E: 300*m*,345°
- E Fin: 336*m*, 230°



c 6.3*km*,346°

6



- **U** 210*m*
- **c** 214°



- **b** 268⁰
- **c** 51 mins
- **10 a** 125km, 45°, 375km, 267°, 295km, 106°
 - **b** 295km, 286°, 375 km, 87°, 125km, 225°

ANSWERS (

- **11** B, 200*m*, 355°
- **12** Example answer:

Beginner

A to M

214°, 430m

M to E

280°, 600m

E to D

252°, 350 m

Total distance = 1480m

Course meets the criteria as the total distance covered is under 1.5km

Intermediate

G to M

130°, 560m

M to E

280°, 600m

E to T

126°, 740m

Total distance = 1900m

Course meets the criteria as the total distance covered is longer than the beginner course and is under 2km

Expert

G to M

130°, 560m

M to E

280°, 600m

E to T

126°, 740m

T to A

19°, 730m

Total distance = 2630m

Course meets the criteria as the total distance covered is above 2km





d No, Submarine OK on course.





Start-A:11cm:5·5km:84⁰ AB:11cm:5·5km: 160⁰ BC:11cm:5·5km: 250⁰ C-Start:14cm:7km: 343⁰

Exercise 13A

- **1** 24
- **2 a** tin: 42
 - box: 55
 - **b** box
- **3 a** 10 X 12 X 30 10 X 24 X 15 20 X 12 X 15
 - b for the second second



- c 20 X 12 X 15 d 40 X 36 X 30,
- **4 a** 20·4 cm
 - **b** 20
- **5** 21
- **6 a** 6
 - **b** 42
- **7 a** 12
 - **b** 32

220 cm	С	с		с		с		С	
	с		с			с		С	
	А	Α		А	Γ	A	A	Α	A
	А	A		А		А	А	А	А
				3	3!	50 ci	m		

Trip 1

28 size A boxes (2 layers of 14 boxes) 16 size C boxes (2 layers of 8 boxes) Maximum height of boxes is 150cm for 2 layers of size C boxes which is under the van height (190cm)

2 trips are required



Trip 2 14 size B boxes (2 layers of 7 boxes) 1 size C box

Maximum height of boxes is 180cm for 2 layers of size B boxes which is under the van height (190cm)

9

- a (i) 36 X 24 roll multipack
 - (ii) 63 X 12 can pack
 - (iii) 27 X boxes
- **b** (i) £647.64
 - (ii) £343·35
 - (iii) £539·73

10

- **a** 250
- **b** 63 months
- **c** 58
- **11** No. The maximum amount of crates that can fit in the van is 135.

Activity 1 - exercise for student

Activity 2

- **a** 18·2 m
- **b** (i) 32·8 km
 - (ii) roughly Dundee and Perth.
- **c** 4326.5 years

Exercise 13B

- **1 a** won't fit.
 - b Lane 1 L, L, L, L
 Lane 2 L, V, V, V, V, V
 Lane 3 V, V, V, V, V, C, C
 Lane 4 C, C, C, C, C, C, C, C, C, C

a (4,3), (7),(6),(5),(2,3),(5),(8),(6,2),(5),(4)
 b (8),(7),(6,2),(6,2),(5,3),(5,3),(5),(4,4)

3

Note tomatoes arranged height swapped width shelf1: 2 X tomatoes + 12 X oil
shelf2: 4 X tomatoes + 12 X sugar
shelf3: 10 X orange juice + 2 X sugar **4** potatoes in first 4 X 4
In second 4 X 4: potatoes in 4 X 3 section + potatoes in 1 X 2 section + beetroot in 1 X 2

section In first 3 X 8: onions in 1 X 8 + lettuce in 2 X 3 + cabbage in 5 X 2

In second 3 X 8: carrots in 3 X 2, courgette in 3 X 2, beans in 4 X 3

- 6 Room1: 5 X G2W + 3 X G6W
 - Room2: 6 X G3W + 2 X G5W Room3: 4 X G4M + 2 X G1M + 2 X G5M Room4: 6 X G2M Room5: 5 X G3M Room6: 5 X G6M Room7: 4 X G4W Room8: 4 X G1W

Exercise 14A

1	Task	Activity	Preceded by
	А	Find driving instructor	
	BApply Prov licenseCHold Prov license		
			В
	D	Driving lessons	А, В, С
	E	Learn theory	
	F	Book theory	E
	G	Pass theory	E, F
	Н	Book practical	A, B, C, D, E, F, G
	I	Pass practical	A, B, C, D, E, F, G, H
	J	Apply full license	A, B, C, D, E, F, G, H, I

c 10

d A & B & E

2 a

Task	Activity	Preceded by
А	Shower	
В	Find uniform	
С	Dress	А, В
D	Breakfast	
E	Phone	
F	PE kit	
G	Make packed lunch	
н	Pack bag	F, G
I	Clean shoes	

- **b** Brush teeth
- **c** F, B, I
- **d** Less panic.
- e no.

3 a

Order of activities	Simultaneous activities
Initial visit	
Mail quote	
Order fixings	Order scaffolding
Check weather	Arrange time
Load van	
Fix snags	
Send invoice	



4 a

Task	Description	Preceding task	Time
А	Plates cupboard		3
В	Open soup		3
С	Slice bread		3
D	Sauce pan	В	2
E	Heat soup	B, D	5
F	Butter bread	С	3
G	Fill sandwich	C, F	4
Н	Pour juice	А	1
I	serve	A, B, C, D, E, F, G, H	3



c 3+3+2+3+3+4+1+3=22 min

5 a Assemble new furniture and clear old carpet and old furniture from room.





- **6** Washing dishes, clothes wash
 - **a** 11:16
 - **b** 114 minutes

7 a, b

Task	Description	Preceding	Time(min)
А	Sort likes/ dislikes		20
В	Wash wanted clothes	А	80
С	Take unwanted to shop	А	60
D	Iron wanted clothes	А, В	20
E	Wanted clothes-> wardrobe	A,B,D	20

c Do B and C at same time.

8 a Curry, ice cream.

b

Task	Description	Preceding	Time(min)
А	Assemble ingredients		5
В	Fry onion & paste	А	20
С	Add chicken & cook	А, В	20
D	Boil Rice	А	15
E	Drain rice	A, D	2
F	Serve	A,B,C,D,E	1
G	Eat main course	A,B,C,D,E,F,G	15
Н	Open ice cream tub	A	5
I	Serve ice cream	A,H	1

- **c** C & D & H could be done simultaneously.
- **d** Perhaps B and H could be done simultaneously.
- **e** 7:44pm

9 a and **b**

Task	Description	Preceding	Time(min)
А	Film Downing Street		20
В	Interview minister	А	15
С	Review career	А, В	25
D	Speak to colleagues	А, В	25
E	Review replacements	А, В	40
F	Prepare film	A,B,C,D	20
G	Edit film	A,B,C,D,E,F	20

c Need reporter to review career, another to speak to colleagues and another to review replacements all at the same time.



b No. Fastest is 32 hours. (A, D, E, F, G, I, L)

Activity - exercise for student

Exercise 15A

- 1 a Example
 - 0900 School
 - 1530 Walk home
 - 1600 TV
 - 1700 Homework
 - 1800 Dinner
 - 1900 Drive to football
 - 1930 Football practice
 - 2100 Drive home
 - 2130 Computer games
 - 2230 Reading
 - 2300 Sleep
 - 0730 Wake up, shower
 - 0800 Leave home
 - 0830 Meet friends at school
 - **b** Sleep
 - c Reading / shower
 - d





- e Example
 - 0900 Wake up, shower
 - 1000 Brunch
 - 1030 Tv
 - 1200 Travel to town
 - 1230 Meet friends
 - 1330 Lunch
 - 1430 Skateboarding

- 1600 Travel home
- 1630 Dinner
- 1730 Travel to work
- 1800 Work at restaurant
- 2300 Travel home
- 2330 Facebook
- 0000 Sleep



	Get showered and dressed	20	
	Travel to town	30	min
	Choose movie	10	min
	Get tickets and popcorn	10	min
	Film	100	min
	Talk about film	20	min
	Travel home	30	min
	Total 3 hours	s 40	min
b	Get out iron and ironing board	5	min
	Ironing	45	min
	Put clothes away	10	min
	Put iron and ironing board away	5	min
	Total 1 ho	ur 5	min
С	Assemble ingredients	5	min
	Fry oil and onions	5	min
	Fry chicken until brown	7	min
	Add vegetables and sauce	1	min
	Cook until ready	5	min
	Set table	3	min
	Serve	1	min

Moscow

Bucharest

		Eat	15 min		d	1100
		Tidy/wash up	20 min	2	a	1700
		Total 1 hour 2 min			b	2200
3	a	Morag has more shopping time. Travel			С	0900
		costs are almost identical. Ali	has later	3	a	1pm
					b	6pm
	D	Morag: 205 mins			С	11pm
	_	All: 165 mins			d	3am, 14th July
4	C	Morag – more time.		4	а	6:30am, 13 March.
4	a	Exercise for student			b	11am, 28 Dec.
Ex	erci	se 15B		5	а	10:15pm
1	a	H, E, G, F, A, C, B, D			b	11am
	b	A, C and H, E		6	a	1am, 17 Dec.
	С	A: 3 min			b	500 mph
		B: 1 min		7	а	1540, 9 Jan
		C: 1 min			b	337 mph
		D: 1 min		8	a	9 hours 20 minutes
		E: 2 min			b	7 hours 15 minutes
		F: 2 min			С	8 hours
		G: 1 min			d	6 hours 10 minutes
		H: 1 min		9	20:	30
	d	10 min		10	Sta	rt times between:
2	а	G, K, D simultaneously. Then I, J, L, A, C and F simultaneously,	N, E, H, , D, M.		Lor Par	ndon: 1300 – 1500 is: 1400 – 1600
	b	30 days.			NY	0.0800 - 1000
3	a	7:26am		11	100	78
	b	10:45am		12	а	Edinburgh
	С	ShowTime: 11:15				
		Star Maker: 12:15				2000 km at 6°
		Penguin Parade: 14:30				
		Out of this World: 15:45				
	d	Arrive home in time for TV show	w(1853).			Bucharest
Ac	tivity	y – exercise for student				
Ex	erci	se 15C				Algiers
1	a	1500				km: 200 km
	b	1600				10.8 cm = 2160 km {Algiers @ 12° (→ Edinburgh

- b 1600
- 2100 С

- **b** 2000 km at 6°
- c Moscow: Friday, 6:01am, 9:01am Bucharest: Friday, 8:59am, 11:59am Algiers: Friday, 1:44pm, 4:44pm
- **d** 7:21 pm Friday based on speed = 763km/hr
- **13 a** 21 hours 28 min
 - **b** 23:13, Monday 27 Oct.
 - c 7:30am in Auckland
 - **d** 9am 10 am
- Activity exercise for student

Exercise 16A

- **1 a** 235 kg, 265 kg
 - **b** 118 mm, 186 mm
 - **c** 12.8 mg, 13.4 mg
 - **d** 37 ml, 38 ml
 - e 8.2 mg, 8.3 mg
 - **f** 0.65 mm, 0.656 mm
 - **g** 6.544 mm, 6.554 mm
 - **h** $5.35\mu m$, $5.41\mu m$
 - **i** 0.739μ*m*, 0.741μ*m*
- **2 a** (2.95 ± 0.05) cm
 - **b** $(98.8 \pm 1.2)g$
 - $\mathbf{c} \quad (98.2 \pm 0.9)^{\circ}F$
 - $\mathbf{d} \quad (1.4 \pm 0.05) kg$
 - **e** (49.74 ± 0.15) *ml*
 - **f** $(1.246 \pm 0.012) \mu m$
- **3** 14·4 mm, 17·6 mm.
- **4 a** $(11 \pm 1) \mu m$
 - $(17 \pm 2) \mu m$
 - $(22 \pm 10) \mu m$
 - $(34 \pm 11) \mu m$
 - $(65 \pm 5) \mu m$

 - **c** Approximately 6.
- **5** 3.75 kg, 3.85 kg.
- **6** 58 mm, 118 mm.
- 7 595 kg.
- **8** 3.995 m, 4.005 m.
- **9** 10(15 + 0.5) = 155, so No, if he is unlucky the tolerances will work against him.
- Activity Exercise for student

Exercise 16B

- 1 3×50 cm or 5×30 cm.
- **2** Need to avoid door too big for frame. Biggest door is 77cm, smallest frames are 74 and 76 cm. So neither is safe bet.
- **3** Short beam too short for largest gap and long beam too long for narrowest gap.
- **4** Recalibration necessary as 25% outside interval.
- **5** Just within allowances.

Exercise 16C

- 1 257 kg, 277 kg
- 2 Allowing for tolerances, time could be 55.4 s.
- **3 a** 4360 g **b** 13.
- **4** 14, 15.
- **5** 16.
- **6** $3260.25 \, cm^2$
- 7 (5465.18 ± 102.62) cm³
- 8 No.
- **9** Assuming large dimensions are 180.5, 130.5, 120.5 then 2129 l
- 10 a No, could be 456 ml
 - **b** 9135, 10961
 - c £3288.60, £3945.96
- **11 a** $(900.01 \pm 6)cm^2$ **b** 66
 - 68 **d** rectangle
- **12 a** $64.08 \, cm^2$, $69.58 \, cm^2$
 - **b** 1237 g, 1343 g
 - **c** £29799·33, £32352·87
- 13 2 hours 1 min, 2 hours 14 min
- 14 No.

С

- **15 a** 10.35 s, 10.45 s
 - **b** 9.57 m/s, 9.66 m/s

Activity

- 1 a Not non-standard
 - **b** Yes
 - **c** (i) less than 388 g
 - (ii) less than 376 g
- 2 Exercise for student

Exercise 17A

- 1 a painful
 - **b** slightly challenging
 - **c** easy
 - **d** slightly challenging
- **2 a** a and b are OK
- **3 a** 0.43
 - **b** france not as steep, 0.3
- **4 a** Not safe, 0.125
 - **b** 12.5m
 - c Takeoff under power.
- **5 a** 8.77m
 - **b** 4.39
 - c No too near wall.
 - **d** 2.√18 m
- **6 a** No
 - **b** Yes
 - **c** Yes
 - **d** Yes
- 7 a Yes
 - **b** Yes
 - c No
 - **d** Yes
- **8 a** 0.549
 - **b** (i) 1915∙06m
 - (ii) 0·24
 - c Aberystwyth; greater gradient
 - **d** Cairngorm
- **9 a** (ii) is OK
 - **b** Hover mower on a rope.
- **10 a** OK
 - **b** not OK
 - c not OK

Exercise 17B

- **1 a (i)** £21
 - (ii) £30
 - (iii) £36·50
 - **b** 4, 2, 1
 - **c** Up to 2.5. Threshold costs same as for big package.
 - **d** Heavier costs don't vary so much.
 - **e** As c above, smaller packages less profitable.
- **2 a** 39·2°*C*
 - **b** 0.37, 0.6, -0.125, -0.35, 0
 - **c** (i) 4 6, max gradient
 - (ii) 8 9, min gradient
 - **d** Rapidness of temperature change.
 - e (i) fourth
 - (**ii**) 1
 - **f** $37^{0}C$
 - **g** Stabalised at normal.
- **3 a** 0.096, -0.011, 0.10, -0.059, 0.091, -0.21, -0.12, -0.069
 - **b** (i) BC, highest gradient
 - (ii) FG, lowest gradient
 - c Steepness of hill.
 - d AM
- **4 a** 200,0, ≈857, Ω154, 0, 500
 - **b** 2-2.7 minutes
 - **c** Cab has stopped in traffic
 - **d** £4.60
 - **e (i)** £8·20
 - (ii) ± 3.60 depending on estimated cost of the student
 - (iii) Less taxi drivers work unsociable hours so costs are higher
- **5 a (i)** 1
 - **(ii)** -1
 - **(iii)** −0·5
 - **b** 4, between 07:00 and 08:00
 - c After 22:00, no gradient.

6 a (i) -6000

(ii) -12000

(iii) 4000

- **b** 2012 2013, £12000 rise
- **c** 2011 2012 £12000 fall

- **7 a (i)** -5.71 m/min
 - (ii) –2 m/min
 - (iii) 9 m/min
 - **b** 40 min 50 min
 - **c** Faster on way up steepest gradient.

Activity - exercise for student

Exercise 18A

- 1 No.
- **2 a** 138
 - **b** 747.1 cm^2
 - c $81.7 \, cm^2$
 - d More tops per strip; less waste
- **3 a (i)** 18
 - (ii) £161.82
 - **b** £54
 - **c** £30.85
 - d Better online, saves £0.85
- **4** £14·14
- **5 a** £7·23
 - **b** £4·35
 - **c** £18∙40
- **6 a** $11.47 m^2$
 - **b** 22.93 m^2
 - 1 tin is enough.
- 7 Large pizza is less than twice size of small pizza. Large is 885.9 cm²; small is 489.3 cm².
- **8 a** 46.14 *m*
 - **b** £288.84
 - **c** £79.55
- **9 a** £860·37
 - **b** £634·29

- 10 First is cheapest as least area. $3481.75 \, cm^2$ $4712.39 \, cm^2$ $7854 \, cm^2$ **11 a** $203 \cdot 23 m^2$ 13 treatments - £141.10 b **12** £328.79 13 a $184.94 \, cm^2$ £7.90 b **14 a** $706 \cdot 86 \, cm^2$ $493 \cdot 14 \, cm^2$ b $44.78\,cm^2$ 15 a $25155 \cdot 22 \ cm^2$ b (i) (ii) One pot just too short. 16 a 29 b £1507.71 11.66 m 17 a $209.91 m^2$ b (i) $209.91 m^2$ (ii) (iii) $71.05 m^2$ £635.58.
 - **18** 3859 *m*

Activity

White is largest. Blue is smallest.

Exercise 19A

- **1 a** (i) $7696 \cdot 9 \, gm$
 - (ii) 741.02 *gm*
 - (iii) 4674·17*gm*
 - **b** Gold object
- **2 a** 8 cm
 - **b** $302 \, cm^3$
 - **c** 2.83 *cm*
- **3 a** 140 m³
 - **b** 24
- **4 a** 7285*ml*
 - **b** 102 *ml*
 - **c (i)** 71
 - (ii) 43*ml*
- **5** 167 litres
- **6 a** $242 \cdot 5 \ cm^3$
 - **b** 5.57%
 - **c** 162.48*gm*
- **7 a** 1231.5 cm^3
 - **b** $\frac{27}{125}$
- **8 a** $628 \cdot 32 \ cm^3$
 - **b** 5.31 *cm*
- 9 $\frac{1}{3}$
- **10** 4·33 *m*
- **11** 147

b 33.33%
13 5 cm
14 a 0.633 cm³
b 13.826 8m
15 a 8
b 452.39 cm³
c 2895.21 8m
d 017.22 8m
16 8 cm
17 a 300 cm³

12 a 62444.65 mm^3

- **b** 2.65 cm
- **18** 884
- **19** 761

Activity

a total height = H main radius = R volume of large cone = $\frac{1}{3}\pi r^2 H$ volume of small cone = $\frac{1}{3}\pi \left(\frac{r}{2}\right)^2 \frac{H}{2}$ frustrum = $\frac{1}{3}\pi r^2 H - \frac{1}{3}\pi \left(\frac{r}{2}\right)^2 \frac{H}{2} = \frac{7\pi r^2 H}{24}$ $\frac{\text{small cone}}{\text{frustrum}} = \frac{\frac{1}{3}\pi \left(\frac{r}{2}\right)^2 \frac{H}{2}}{\frac{7\pi r^2 H}{24}} = \frac{1}{7}$ **b** 171.5 cm³

Exercise 20A

- **1 a** 12·4 *m*
 - **b** 33·4 *m*
- **2 a** 12·4 *m*
 - **b** 118 m^2
- **3** 5.68 m
- **4 a** 4 *cm*
 - **b** $36 \, cm^2$
- **5 a** 1.41 cm, 1.73 cm, 2 cm **b** 9.15 cm
- **6** 8.77 m
- **7** 314 m
- **8** 8.87 m
- 9 No. Too steep.
- **10** 250 cm
- **11 a** 6.84 *m*
 - **b** 4.56
 - c No. Too steep.
- **12** 4·24 cm
- **13 a** 11.9 *cm*
 - **b** 136*m*
 - **c** 26.7 *cm*

- 14 a (i) 28.7 cm
 b (i) 88.5 m
 a (ii) 195 cm
 b (ii) 694 m
 15 No.
- 16 No.
- **17** 11.9 *cm*
- **18 a** 88.5 *m*
 - **b** 13.4 *m*
 - **c** 5 *m*
- **19** Yes, space diagonal is 8.37m.
- **20** No, space diagonal is 4.98 m.
- 21 a Very challenging
 - **b** Manageable
- 22 Yes, gradient is 0.88.

Activity

- 1 a Exercise for student
 - **b** 10 triangles will reach 3.7 cm
 - **c** 65%
- 2 a Exercise for student
 - **b** 10 triangles will reach 1 *cm*
 - **c** 21.6%
- 3 Exercise for student

Exercise 21A

- **1 a** 2.352
 - **b** 23.561
 - **c** 3.450
 - **d** 345.949
 - **e** 0.010
 - **f** 13.418
 - **g** 2.041
 - **h** 5.170
 - i 0.040
 - j 18.000
 - **a** 7900

2

- **b** 3.5
- **c** 290
- **d** 0.48
- **e** 24
- **f** 3500
- **g** 0.0054
- **h** 6500
- i 0.00046
- **j** 230000
- **3** 83·1 g.
- **4** a,b,c

UK	400000	6400000	6·25
USA	6400000	320000000	20
Canada	1400000	35000000	40
Germany	640000	80000000	8
Scotland	55000	5300000	10.38
Ireland Australia	99000 810000	4400000 24000000	22·5 33·75
India	4200000	1200000000	3.5

d Canada, Australia and Ireland. Population density, national wealth.

Exercise 21b

- **1 a** number must end in 0
 - **b** should be around 6
 - c should be around 8000
 - **d** should end in 4
 - **e** should be around 13+2=15
 - **f** should end in 2
- **2 a** 8000
 - **b** 11
 - **c** 4800
 - **d** 250
- **3** £14
- 4 Monday 12th, 3:30PM
- 5 £1400
- 6 Tin volume= $3000\frac{1\cdot 2}{40}$, 3000 g. $\frac{\text{changein } y}{\text{changein } x}$
- **7 a** 6
 - **b** 10
 - **c** 7
 - **d** 20

Activity - exercise for student

Exercise 21C

- 1 £486 inc VAT
- **2** 4 X 49 + 3 X 30
- **3** 13 weeks.
- 4 free roamer
- **5** £612.08
- **6** £382.61
- **7** £390·46

1

Exercise 21D

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{1}{10}$	0.1	10%
$\frac{3}{4}$	0.75	75%
$\frac{2}{3}$	0.67	67%
$\frac{1}{3}$	0·3	33%
$\frac{3}{4}$	0.75	75%
$\frac{1}{5}$	0.2	20%
7 5	1.4	140%
$\frac{5}{2}$	2.5	250%

- **2** a, b
- 3 South's in cheaper.
- 4 1496 [rounded up]
- **5** 48547
- **6** £237.90, 3.8%
- 7 never shop online: 84 online+real: 231 never shop (rounded): 13
- 8 Homeland
- 9 a
 scotia
 £4719·92

 hebrides
 £4643·89

 harold
 £4947·80

 zebra
 £5157·87
 - **b** £513.98

Exercise 21E

- **1** 32.4 m, $32.72 m^2$
- **2 a** $26 \cdot 9 m^3$
 - **b** $27500 \, cm^3$

- **3 a** 1007 tiles are required
 - **b** Tiles cost £4292.50, Adhesive £239.94, Grout £56.97. Total for materials is £4589.41
 - **c** Hours total is £932 (including VAT), material total is £5507·29 (including VAT). Total for job is £6443·29.
- **4** The can should be between 7 cm high and 7 cm diameter and 10cm high and 6cm diameter
- **5 a** 36.6 cm => 366 m
 - **b** 94.1 cm => 941 m
 - **c** 1632 m^2
 - **d** 7820 m^2
- **6** 942.5 cm^3
- **7 a** 120 cm
 - **b** $18000 \, cm^2$
- 8 Yes, Volume is $3 \cdot 2 m^3$.
- 9 No.
- **10** $56.55 \, cm^3$
- **11 a** $26554 \cdot 3 \ cm^3$
 - **b** Two required 76.77 kg.

Exercise 21F

- 1 2800 ml, 700 ml
- 2 2 hours 42 min
- 3 Helen
- **4 a** 1016
 - **b** 847
 - **c** £91.50
- 5 a In same order as question:
 - 833, 3, 3, 83, 83, 3, 400
 - **b** £10.32
- **6** 10·44m/s, 10·42m/s, 9·48m/s, 8m/s, 7·28m/s, 6·23m/s, 5·7m/s
- **7 a** 11:45.
 - **b** Exercise for student
- 8 Yvonne
- 9 Dinky
- **10 a** 450ml, 300ml
 - **b** 480ml, 360ml, 240ml

11 0.35kg, 1.225kg, 0.525kg

12 a	kitchen:	5·85 m X 3·83 m
	bathroom:	3·83 m X 2·03 m
	bed1:	5·85 m X 3·83 m
	bed2:	4·73 m X 3·83 m
	LR:	9∙90 m X 5∙85 m
		+ 6·75 m X 3·83 m
	hall:	3·83 m X 2·03 m
		+ 2.03 m X 3.83 m

- **b** £4326·16
- **13** Answers in minutes

Stonehaven:	33
Elgin:	137
Fraserburgh:	90
Peterhead:	65
Ellon:	37
Inverurie:	33

Activity

- **1 a** 10
 - **b** 1342
 - **c** 3 hours 5 mins
 - **d** 6
 - **e** 30.81mph
 - **f** 1 hour 44 mins
- **2** £60·11
- **3 a** 1210 kg
 - **b** 16.35 kg
- **4** 11
- **5 a** 11.8° *C*
 - **b** 9.2°, 3.6°
 - **c** April mean is lower and April sd is higher.
 - **d** 0.4
- **6 a** 5.45 km
 - **b** 2 hours 44 mins

Chapter 22 answers in ${}^{0}C$ 4 **Exercise 22A** 25 a 17 1 а (i) 3 b (ii) -7 6.5 С 38 d b **(iii)** 6 answers in ${}^{0}C$ (iv) 17 5 38 10 (v) а С (vi) 23 b 23 (vii) 30 -24 d С (viii) 180 d 0 295 mph 2 75g 6 а b 130g **Exercise 22B** 210g С $160^{\,0}C$ 1 а 270g d $160^{0}C$ b answers in litres (1) 3 $390^{0}F$ С (i) 0.08 $180^{0}C$ d (ii) 0·33 $280^{0}F$ e (iii) 0·12 $375^{0}F$ f (iv) 0·28 **(v)** 0.09 (vi) 0·36 **2** a, b 10 200 8 150 250 100 300 50 350 16 350 400 0 18 0 Yes 3 a ii 6 7 b iv 35 iii С d i She mistook 0.2 - 0.4 for 0.2 - 0.3. 4 0.23 0.3 35 ♦ 0.4 0.2L 5 yes, range ~ 275 miles.

60 cm

40 cm

50 cm

35

Exercise 22C

- **1 a** 0.456 km
 - **b** 7800 ml
 - **c** 0.2 km
 - **d** 13 l
- **2** 650 g of pasta, so 325+325.
- **3** d
- **4** 3 kg
- **5** 6 times higher than average.

- **6 a** 80 km/h
 - **b** 75 mph
 - **c** Graham.
- 7 Yes.
- 8 1875 ml
- **9 a** 6.87 m/s
 - **b** 132·33 s
- 10 Yes.

Exercise 23A

- **1 a** 9°C
 - **b** Cardiff, London.
 - **c** 6
 - **d** London
 - e Manchester
 - f air pressure or wind speed
- **2 a** 72
 - **b** 36
 - c football 34, gym 11, hockey 14, netball 4, swim 8, tennis 7
 - **d** 34
- **3 a** largest numbers in late 40s, but evenly spread up to early 60s then decline.
 - **b** Very largely skewed towards very young. No peak, numbers decline rapidy after 15 years.
 - c UK middle age largest numbers, India greatly skewed towards high numbers of young

4 a $13\frac{1}{3}$ oz oaty

 $5\frac{1}{3}$ oz butter

24 oz blueberries

 $11\frac{1}{3}$ oz caster sugar

grated zest 3 limes

 $26\frac{2}{3}$ oz cream cheese

 $\frac{2}{3}$ pint double cream

 $5\frac{1}{3}$ tsp gelatine

 $\frac{2}{3}$ pint sour cream

b 125 g plain flour

275 g butter

- 5 eggs
- 563 g sugar
- 478 g walnuts
- $2\frac{1}{2}$ tsp baking powder.

- 5 a lynn healthy
 - Jess overweight
 - Andy healthy

Dave overweight

- Pete healthy
- Ola underweight
- b (i) Lynn 607 685·2 jess Andy 297 Dave 833 Pete 308.6 Ola 440 (ii) None.

Exercise 23B

- **1 a** 15m
 - **b** 24m
 - **c** 96m
 - **d** 63m
 - e thinking distance independent of weather, braking dist much greater in wet weather.



2 Male drivers should be ~ 24, female ~ 12 female maintenance ~4

male drivers over=represented, female drivers – slightly under. Rest OK.

- **a** downwards
 - **b** fall
 - **c** Pout
 - **d** Whiting

- e Apart from 1970 when there was more haddock, roughly similar although out of phase.
- f reduced
- **4 a** Average very slightly higher than 61-90 average.
 - **b** Definite increase.
- **5 a** Charity due to numbers of observations, and time-spread.
 - **b** mean, decimal fraction.
- **6** Mean time decreases with trainng. Slight reduction in IQR. Greatest improvement at beginning of training.
- 7 a Venturer is safest.
 - **b** Pioneer, due to extremes.



d 8m/s more efficient.

Activity 1 – Villa Elvira – Highest percentage return on purchase price, 5:53% per year.

Exercise 24A

- 1 lucky dip а
 - b hoopla, find king. More likely to lose than win.
 - hoopla:16, king: 92, dip: 121 С
 - d King more popular, more cash.
- 2 (i) 12 а
 - 28 (ii)
 - (iiii) 42
 - (iv) 60
 - Aberdeen has average of $4 \circ C$ and b high probability snow.
 - Higher North = higher snow (i) С probability
 - (ii) Higher North = colder.
- 3 (i) 13, 16, 14 а
 - $\frac{13}{30}$, $\frac{16}{31}$, $\frac{7}{15}$ (ii)
 - (iii) 43·3%, 51·6%, 46·7%
 - (iv) April
 - b 30%, 50%, 90% (i)
 - **(ii)** Rises
 - (iii) June
 - С June
 - d Exercise for student $\frac{4}{25}$

4 a (i)

- 1 (ii) 50
- $\frac{71}{100}$ (iii)





- see b, numbers in millions. С
- d (i) Car, Train, underground, bus
 - (ii) Car, pavements, bus

Car top priority for both. London high priority for train, underground and bus; Rest of UK less of a priority.



- trend is negative with increasing age, b men higher
- Age restricts ability С (i)
 - possibly cultural, team sports (ii) issues.
- Dance or walking. Women and over d 55s need more exercise.

Exercise 24B

5

- 23 1 а 119
 - 167 b 212
 - С They missed out the 0 weight results. No.
 - B. Greater chance of 3kg or more. d

- student 4 а conservative 41.7% $\frac{1}{15}$ 2 a (i) liberal 12.0% $\frac{2}{15}$ (ii) Labour 22.9% 1 15 SNP 20.0% (iii) other 3.4% b (i) 17 shopper conservative 9.3% (ii) 35 liberal 6.6% (iii) 17 Labour 27.7% Real results not as good as estimates in С b. PE class better than average. SNP 51.3% d larger selection taken at random. other 5.1% 43.0% 3 (i) а b Shoppers much bigger sample, students (ii) 57.0% b (i) 60.8% С Shoppers 36.5% (ii)
 - No, needed some other candidate names. С Results do not reflect population.
- not representative of overall population
- Opinion polls can draw out extreme d views that are not voted on in real election. Protest views.

Case Studies

Very enterprising:

- **1 a** £167.50
 - **b** £1.71
- **2 a** 1250
 - **b** Place candles on a heat resistant surface Place candles in a holder
 - Keep candles away from pets/children
 - Keep candles apart
 - Don't place candles under shelves
 - Double check candles are out when extinguishing

Or any other relevant point

Wedding dresses:

- **1 a** £1287.49
 - **b** Yes. Shop deal is £1193.27 which is £94.22 cheaper
- 2 Wedding Belles has much wider range of prices. The median price is lower in Wedding Belles.

Frank's case study:

- 1 a Cheaper in USA. USA is £1152.62, Germany is £1472.61 and Japan is £1431.64
 - **b i** USA. USA is £1225.72, Germany is £1522.10 and Japan is £1487.11
 - ii Yes. The total cost from USA is £1225.72. £174.27 cheaper than the UK
- **2 a** 26, 8.56
 - **b** DGS games are cheaper and prices are less variable

Basketball players:



c 1.72 m

d Between 11 and 16 there is a strong positive correlation between age and height. For 16 and over there is no, or very weak positive correlation.

2 a i 1.7 m

iii



- **b** Median height in 2009 is less but range slightly greater.
- **3 a** 0.382%
 - **b** 98.838%
 - **c** Medium risk. There is a low probability of injury but quite serious harm can be caused if injury occurs.

Nursing home:

- **1** No. Gradient is too steep 1:13.75
- **2** 9:22 am

Hidden treasure:



- **b** 26°, 400 m
- c No. Course is 1110 m and minimum allowed in 1150 m

Community centre:

- **1 a** 3.41 m
 - **b** 4.26
 - c No. Greater than 4
 - **d** Yes. Gradient is now 3.35
- 2 Yes. Cost is £199.96

Drinks package:

1 a 5.87 cm

- **b** $1 \times 4 \times 6 = 3086 \cdot 21 \text{ cm}^2$
 - $2 \times 3 \times 4 = 2832.16$ cm2

The second box is more efficient as has less volume.

2 a 9.358 kg **b** 38

Buying a car:

- 1 a Dixie, Lagonda
 - **b** £440
 - **c** £500
 - **d** 34.1%
- 2 Yes

Allotments:

- 1 Michael's. Michael's is $30m^2$ and Janice's is $27{\cdot}71~m^2$
- 2 Michael by 1.46 m²

Buying a sofa:

- 1 a deal1: £108·80 extra deal2: £127 extra
 - **b** deal1:10·9% deal2:12·7%
 - c deal 1 as smaller interest
- **2 a** 112.5 kg
 - **b** £55
- **3 a** £275.80
 - **b** 6 years

Extended case studies

Jo's case study:

- **1 a** £1343.75
 - **b** £102.08
 - **c** £81.69
 - **d** £73·91

e

Forth Road Bridge:

- **1 a** Annual crossings are increasing with time.
 - **b i** 22.7%

ii 916%

- c Increase capacity, lower traffic on Forth Road Bridge
- 2 a 75 km/h
 - **b** 121 seconds
 - c Yes, less than 50 mph

J McNab	Employee number 1284			NI Number JH194727G	Month June
Payments	Value	Deductions	Value		
рау	1343.75	Income tax NI Pension @ 5.5%	102·08 81·69 73·91		
Gross pay	£1343.75	Total deductions	£257.68	Net Pay	£1086.07

- **2 a** £1396·40
 - **b** No. She has a surplus of £496·15 each month but needs £545 each month.
- **3 a** Plug cheapest at £434.60.
 - **b** Tower Technology is the best deal in the second year as the cost is £410.00
 - c Yes. £8·54 each per month instead of £15

The Zoo:

- 1 a Entrance Hippos Meerkats Chimpanzees – Koalas – Flamingos – Penguins – Rhinos
 - b 040°, 88m
 303°, 56m
 056°, 88m
 000°, 56m
 270°, 76m
 270°, 104m
 180°, 104m

- **2 a** 12:17pm
 - **b** 12:00 pm

2011 Scottish Parliament Election:

- **1 a** 44%
 - **b** 26%
 - c Both won a higher percentage of seats than their percentage of votes. SNP 53% of seat, Labout 29%
- **2 a i** 50
 - **ii** 4.5
 - **b** Labour MPs are younger on average but the age is more variable
- 3 a £8 Billion
 - **b i** 14.7%
 - ii Higher than the UK Government (12.5%)

Air travel:



- **b** Too expensive. From using best-fitting line you would expect price to be about £300
- **c** For domestic flights there is a very wear positive correlation. For international flights there is strong positive correlation.

- **2 a** Mean = ± 545 , SD = ± 112.03
 - **b** Mean = ± 560 , SD = ± 112.03
 - **c** Prices to Toronto are higher on overage and much less variable
- **3 a** 1447
 - **b** 2200 till 0400 (UK time)

Removal day:

- **1** 585, 13 × 5 × 9
- 2 No. 5.03 is max length that will fit.
- **3 a** 72256.63cm³
 - **b** Yes. It will fit and is 173.4kg so less than the max of 400kg
- **4** No. They will take approximately 14 hours and 1 minute

Fundraising day:

1

- a 3 eggs
 125g caster suger
 3ml vanilla extract
 125g self-raising flour
 83g unsalted butter
 208g icing sugar
 - **b** 3620 cm³
 - **c** 764 cm
 - **d** 9.0 cm
 - e i 810 cm
 - ii Cylinder uses 46 cm less ribbon.
- **2 a** 1/5
- **b** i 40
 - ii £20

Preparation for assessment

Paper 1 – Non-calculator





15 162 000 cm³

Paper 2 – Calculator

- **1 a** Yes, median is 121
 - **b** Yes, all between 116 and 124
 - c Happy Eats mean 120.67, sd 7.66
 Yummy Treats mean 120.83, sd 3.06
 Yummy Treats slightly more on average and much less variable
- **2 a** £1175.50

3 a

b i £3150



- Travel 2km on a bearing of 090°
 Travel 3.3 km on a bearing of 349°
- c Yes. He can get there in 16 min
- **4 a** 1:6:2
 - b Sean €2607
 Hilda €15642
 Kevin €5214
 - **c** £4149.82
 - **d** Yes. He has JPY 385 124
- **5 a** 489·12m³
 - **b** 1 136 223 Kg
- 6 5·29m
- 7 Yes, gradient is 1.14, weight is 31.98 kg/m²
- 8 a Peg tiles £25 453.00 Concrete tiles £15 910.18 Barrel tiles £38 372.13
 - **b** Concrete tiles, lowest total cost
- **9 a** £518, £504, £516
 - **b** Comfee Settee
 - **c** £548.53