

### Exercise 12.2

- (a)  $472 \text{ cm}^2$  (b)  $216 \text{ m}^2$
- (a)  $108 \text{ m}^2$  (b)  $408 \text{ cm}^2$
- (a)  $64,000 \text{ cm}^2$  (b)  $230,000 \text{ cm}^2$   
(c)  $0.05 \text{ m}^2$  (d)  $7.89 \text{ m}^2$   
(e)  $42 \text{ mm}^2$  (f)  $13.5 \text{ cm}^2$
- (a)  $0.456 \text{ m}^3$  (b)  $0.0209 \text{ m}^3$   
(c)  $8,000,000 \text{ cm}^3$  (d)  $70,000 \text{ cm}^3$   
(e)  $0.094 \text{ cm}^3$  (f)  $1,060 \text{ mm}^3$
- (a) surface area =  $97\frac{3}{4} \text{ in}^2$ , volume =  $55 \text{ in}^3$   
(b) surface area =  $734 \text{ cm}^2$ , volume =  $1,140 \text{ cm}^3$
- (a) surface area =  $16\frac{2}{3} \text{ in}^2$ , volume =  $4\frac{17}{27} \text{ in}^3$   
(c) surface area =  $73\frac{1}{2} \text{ ft}^2$ , volume =  $42\frac{7}{8} \text{ ft}^3$
- (a)  $360 \text{ m}^2$   
(b)  $13\frac{1}{2} \text{ ft}^2$
- Triangular prism A,  $195 \text{ cm}^2$
- (a) 3 boxes  
(b) \$25.8
- (a)  $78 \text{ m}^2$   
(b) \$222.3
- (a)  $0.0674 \text{ m}^3$   
(b)  $1.162 \text{ m}^2$
- 5 cm
- volume =  $64 \text{ cm}^3$ , surface area =  $96 \text{ cm}^2$

### Problem Solving Corner

#### Try It!

- 3.2 cm

### Practice Questions

- 162; 222
- $13.5 \text{ ft}^3$
- $\frac{7}{128} \text{ m}^3$
- Yes, the surface area of the box is  $3,100 \text{ cm}^2$ , and the area of the paper is  $3,200 \text{ cm}^2$ . Since  $3,200 \text{ cm}^2 > 3,100 \text{ cm}^2$ , there will be enough paper to wrap the box.
- (a) new box  
(b) new box
- 5.4 cm
- 10 cm
- 37.5 cm
- (a) 16 cm, 16 cm, 20 cm  
(b)  $5,120 \text{ cm}^3$
- $X : 1, Y : 5, Z : 4$

### Chapter 13 Displaying And Comparing Data

#### Try It!

- (a) Yes (b) No  
(c) No (d) Yes
- 20.5 years old
- (a)  $x = 17$   
(b) 24 years old
- 14.8 cm
- A: No mode  
B: 72 beats per minute  
C: 71 and 75 per minute
- (a) 173 cm (b) 175 cm  
(c) 175 cm
- (a)  $57.2 \text{ }^\circ\text{F}$   
(c) From the dot plot, we observe the following:
  - The data vary from  $50 \text{ }^\circ\text{F}$  to  $68 \text{ }^\circ\text{F}$ .
  - The data cluster between  $54 \text{ }^\circ\text{F}$  and  $61 \text{ }^\circ\text{F}$ .
  - The lowest temperature and the highest temperature deviate considerably from the mean temperature.
- (a) 20 cars (b) 56 people  
(c) 30%  
(d) Mean: 2.8 people, Median: 2.5 people
- (a) Median: 5 books. Mean: 5.4 books  
(b) The mean: 5.4 books
- (a)
 

Time ( $t$ min)	Tally	Frequency
$30 \leq t < 40$	###	5
$40 \leq t < 50$	### ## /	11
$50 \leq t < 60$	### ///	8
$60 \leq t < 70$	////	4
$70 \leq t < 80$	//	2
	Total	30

- (c) Interval  $40 \leq t < 50$

- (d)  $\frac{8}{15}$

- (a) Histogram A: approximately symmetric, Histogram B: skewed right  
(b) Histogram A: the interval  $70 \text{ cm} \leq \text{Length} < 80 \text{ cm}$ , Histogram B: the interval  $60 \text{ cm} \leq \text{Length} < 70 \text{ cm}$   
(c) Histogram A: class  $70 \text{ cm} \leq \text{Length} < 80 \text{ cm}$  with 25 ropes, Histogram B: class  $50 \text{ cm} \leq \text{Length} < 60 \text{ cm}$  with 25 ropes
- (a) 32 (b) 44
- (a) City A: mean:  $45 \text{ }^\circ\text{F}$ , range:  $10 \text{ }^\circ\text{F}$   
City B: mean:  $49.3 \text{ }^\circ\text{F}$ , range:  $6 \text{ }^\circ\text{F}$   
(b) The weather in city A is generally warmer than in city B as it has a higher mean temperature. City A has a larger range, this tells us that the temperature in city A is less consistent than in city B.

14. (a) \$22  
 (b) \$1.3, the cost of lunch for women, on average, differ by \$1.3 the mean cost of \$22.
15. (a) Group X: mean: 64, Group Y: mean: 64  
 (b) Group X: MAD: 14, Group Y: MAD: 3.1  
 (c) Group Y
16. (a) 23  
 (b)  $Q_1 = 15, Q_3 = 37$   
 (c) IQR = 22
17. IQR = 17
18. (a) MIN = 52,  $Q_1 = 63.5, Q_2 = 84, Q_3 = 105, \text{MAX} = 145$   
 (c) IQR = 41.5  
 (d) 1. The numbers of monthly calls vary from 52 to 145  
 2. The IQR is 41.5; the middle 50% of the numbers of calls are between 63.5 and 105  
 3. Half of the numbers of calls are more than 84.
19. (a) 150  
 (b) Median height of plants under A: 35 cm, Median height of plants under B: 39 cm  
 (c) IQR of heights of plants under A: 15 cm, IQR of height of plants under B: 11 cm  
 (d) Under condition B

### Exercise 13.1

1. (a) Yes (b) No  
 (c) No (d) Yes
2. (a) Mode (b) Mean  
 (c) Median (d) Mode  
 (e) Mean
3. (a) ▼ (b) blue and red  
 (c) pear
4. (a) (i) Mean: 7, Median: 8, Mode: 10  
 (ii) Mean: 5, Median: 3, Mode: 3  
 (iii) Mean: 6.5, Median: 6, Mode: 5  
 (iv) Mean: 9, Median: 9.5, Mode: no mode  
 (v) Mean: 8.3, Median: 6, Mode: 4  
 (b) (i) Mean: 7 (ii) Mean: 5  
 (iii) Mean: 6.5 (iv) Mean: 9  
 (v) Median: 6
5. (a) 500 (b) 39 years old
6. (a) 85 (b) 75.5  
 (c) Median: 86, Mean: 83
7. 400 miles
8. (a)  $x = 9$  (b)  $x = 5$   
 (c)  $x = 14$
9. (a) 78.2 lb (b) 21.4 lb  
 (c) 15.6 lb (d) Median
10. (a) Player A: Mean: 19.3, Median: 20, Range: 12  
 Player B: Mean: 19.7, Median: 11, Range: 38  
 (b) Player A
11. (a) Store A (b) Store B
12. (a) False (b) False  
 (c) False (d) False

13. (a) 21 (b) 19  
 (c) 

Mark	14	15	16	17	18	19	20
Number of students	1	2	4	3	4	5	2

 (e) Median
14. (a) 6 (b) 16  
 (c) (i) 36 (ii) 226  
 (iii) 9 (ii) 12
15. (a) 24
16. (a)  $x = 8$  (b)  $x = 7$   
 (c)  $x = 10$

### Exercise 13.2

1. (a) 17 (b) 2 kg  
 (c) Greatest weight: 66 kg; Lowest weight: 32 kg  
 (d) 42 kg  
 (e) The data clusters between 43 kg and 52 kg.
2. (a) 25 (b) 10 points  
 (c) 21 to 30 (d) class 31 to 40  
 (e)  $\frac{12}{25}$
3. (a)

Amount Spent, \$x	Frequency
$5 \leq x < 15$	1
$15 \leq t < 25$	0
$25 \leq t < 35$	4
$35 \leq t < 45$	8
$45 \leq t < 55$	5
$55 \leq t < 65$	2

- (b) \$10  
 (c) No, \$44.99 is in interval  $35 \leq x < 45$ , and \$45 is in interval  $45 \leq x < 55$   
 (d) Class  $35 \leq x < 45$
4. (a) Dot plot (b) Dot plot  
 (c) Histogram (d) Histogram
5. (a) 118 apps (b) 5.9 apps  
 (c) Median: 6 apps, Mode: 5 apps  
 (e) Mean
6. (b) Approximately symmetric (c) 6.5  
 (d) 6 (e) Mean
- 7.

Amount Spent, \$x	Frequency
$1 \leq x < 15$	2
$1.5 \leq x < 2$	6
$2 \leq x < 2.5$	10
$2.5 \leq x < 3$	12
$3 \leq x < 3.5$	13
$3.5 \leq x < 4$	17

- (b) 50% (c) Skewed left

8. (a) 65%  
 (b) Class height between 160 cm to 165 cm

10.

Distance, $x$ in meters	Frequency
$3 \leq x < 4$	3
$4 \leq x < 5$	5
$5 \leq x < 6$	9
$6 \leq x < 7$	11
$7 \leq x < 8$	4

- (c) Interval  $5 \leq x < 6$   
 (d) 8 boys

11. (a) 66% for boys and 52% for girls

13. (a) (i)

Amount Raised, \$ $x$	Frequency
$0 < x \leq 4$	4
$4 < x \leq 8$	9
$8 < x \leq 12$	5
$12 < x \leq 16$	4
$16 < x \leq 20$	5
$20 < x \leq 24$	3

(ii)

Amount Raised, \$ $x$	Frequency
$0 < x \leq 6$	9
$6 < x \leq 12$	9
$12 < x \leq 18$	6
$18 < x \leq 24$	6

- (c) 1. Modal class  $8 < x \leq 12$   
 2. Modal class  $6 < x \leq 12$   
 (d) With a class size of \$4

6. (a) MIN = 3.4,  $Q_1 = 3.5$ ,  $Q_2 = 3.6$ ,  $Q_3 = 3.75$ ,  
 MAX = 3.9, IQR = 0.25

7. (a) range = 35 cm, IQR = 15 cm  
 (b) 25 cm

8. (a) Range: 1.3 m, Mean: 4.5 m, MAD: 0.3 m  
 (c) Both decreased  
 (d) No, median is better.

9. (a)  $Q_2 = 70$ , IQR = 20, Range = 55  
 (b)  $Q_2 = 60$ , IQR = 25, Range = 60  
 (c) Class A  
 (d) Class B

10. School A: Mean: 70 dB, MAD: 7.25 dB.  
 School B: Mean: 69 dB, MAD: 3.5 dB.

11. (a) Same range

- (c) No

- (d) Group 1:  $Q_2 = \$31$ ,  
 Group 2:  $Q_2 = \$31$ ,  
 Group 3:  $Q_2 = \$33$

- (e) Group 1: IQR = \$2,  
 Group 2: IQR = \$6,  
 Group 3: IQR = \$6

12. Not changed

13. 1, 1, 1, 1, 1

14. (a) 7, 9, 14

- (b) 12, 8, 33

### Exercise 13.3

1. (a) Range: 11, Mean: 26, MAD: 4  
 (b) Range: 9, Mean: 5, MAD: 3  
 (c) Range: 7, Mean: 5, MAD: 2  
 (d) Range: 9, Mean: 6.5, MAD: 2.375  
 (e) Range: 12, Mean: 14, MAD: 3
2. (a)  $Q_1 = 9$ ,  $Q_2 = 18$ ,  $Q_3 = 24$ , IQR = 15  
 (b)  $Q_1 = 4$ ,  $Q_2 = 5$ ,  $Q_3 = 8.5$ , IQR = 4.5  
 (c)  $Q_1 = 13.5$ ,  $Q_2 = 18$ ,  $Q_3 = 20$ , IQR = 6.5  
 (d)  $Q_1 = 10$ ,  $Q_2 = 20.5$ ,  $Q_3 = 27$ , IQR = 17
3. (a) 25 m (b) 15 m  
 (c) 16 m  
 (d)  $Q_1 = 13$  m,  $Q_3 = 19$  m  
 (e) IQR = 6 m
5. (a) IQR = 24  
 (c) MIN = 5,  $Q_1 = 13$ ,  $Q_2 = 24$ ,  $Q_3 = 37$ , MAX = 45