

Cardinal Newman High School

Mathematics Department



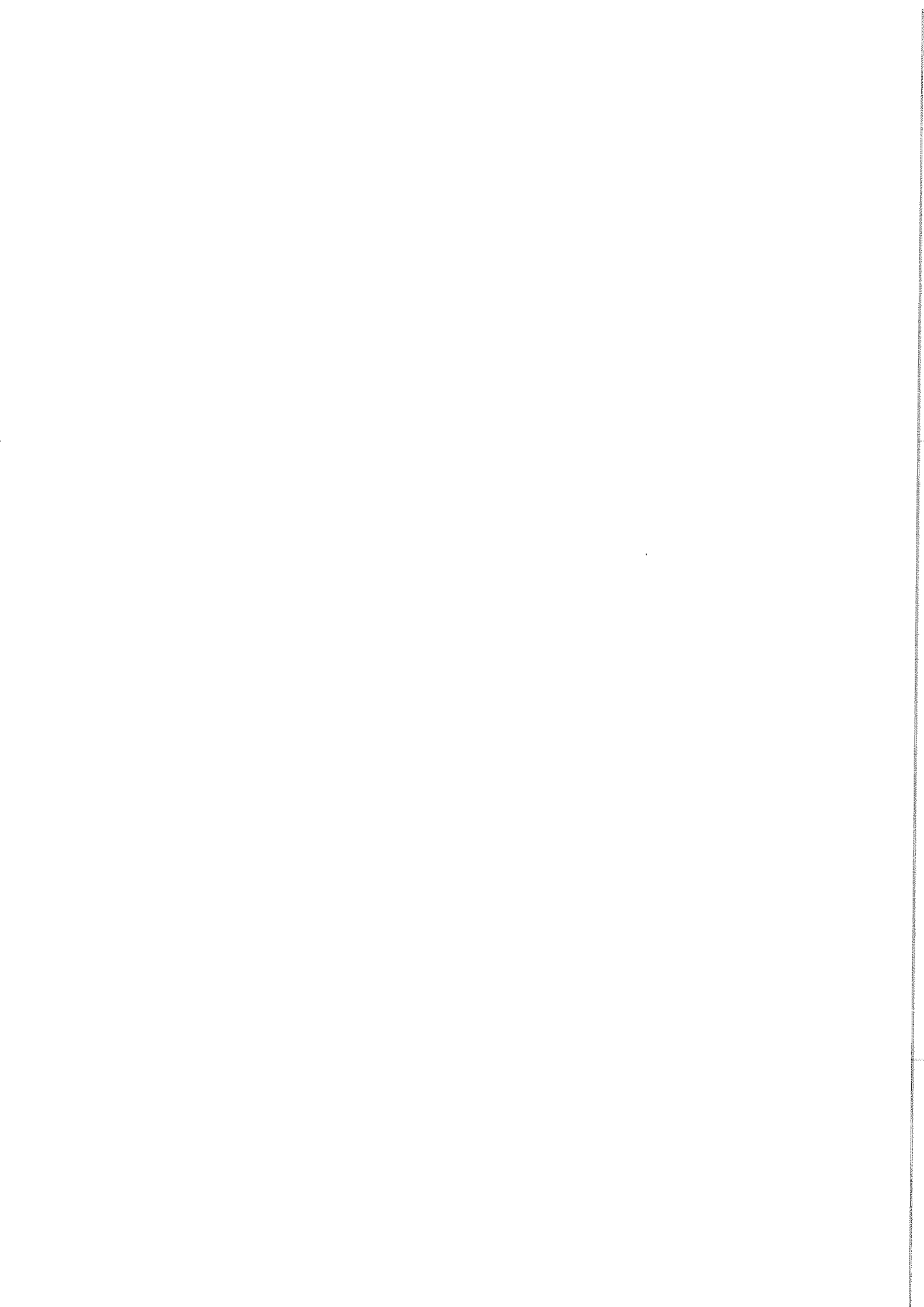
S3 (C) Homework Booklet

Mathematics

Homework tasks should be completed in pupil's homework jotter. Please **do not** write on this booklet as it will be returned to the teacher.

Homework should be presented neatly using a pencil and all working shown.

Pupils should use their homework diary to record the given task and completion date.



Exercise 1

Expand and Simplify the expressions:

1. $5(a + 3)$
2. $4(e - 5)$
3. $6(d + 7)$
4. $3(r + 2)$
5. $7(d - 11)$
6. $6(e + 12)$
7. $4(a - 5)$
8. $3(3a + 6)$
9. $7(5a - b)$
10. $5a(a + 12)$

Exercise 2

Expand and Simplify the expressions:

1. $8(a + 4)$
2. $2(e - 7)$
3. $3(d + 9)$
4. $5(r + 12)$
5. $9(d - 13)$
6. $11(e + 10)$
7. $14(a - 3)$
8. $13(3a + 3)$
9. $11(6a - b)$
10. $9a(a + 11b)$

Exercise 3

Expand and Simplify the expressions:

1. $10(a + 4)$
2. $6(e - 1)$
3. $9(d + 15)$
4. $-5(r + 8)$
5. $-3(d - 7)$
6. $12(e + 10)$
7. $-(a - 6)$
8. $-(5a + 1)$
9. $-2(2a - 3b)$
10. $10a(2a + 14)$

Exercise 4

Expand and Simplify the expressions:

1. $3(a + 9)$
2. $20(e - 10)$
3. $100(d + 60)$
4. $-8(r + 1)$
5. $-4(d - 25)$
6. $7(e + 70)$
7. $-(2a - 6)$
8. $-(-2a + 1)$
9. $-(-5a - 7b)$
10. $11a(2a + 11)$

Exercise 1

Expand and Simplify the expressions:

1. $2(a + 3)$
2. $3(a - 5)$
3. $5(2a + 3)$
4. $6(4a - b)$
5. $3(2a + 4b)$
6. $5a(3b + 2c)$
7. $6b(2c + 3d - 4a)$
8. $3f(7g - 4d + 5f)$
9. $3(4r + 5) - 18$
10. $5(6s - 10) + 27$

Exercise 2

Expand and Simplify the expressions:

1. $3(a + 5)$
2. $8(a - 7)$
3. $6(2a + 5)$
4. $2(3a - d)$
5. $9(3a + 2b)$
6. $6a(5b + 4c)$
7. $7b(5c + 2d - 9a)$
8. $7f(6g - 7d + 5f)$
9. $4(3r + 2) - 15$
10. $8(4s - 8) + 57$

Exercise 3

Expand and Simplify the expressions:

1. $5(a + 12)$
2. $4(a - 14)$
3. $7(4a + 15)$
4. $4(8a - 2b)$
5. $7(3a + 4b) - 5b$
6. $8a(6b + 4c) - 15ac$
7. $7b(5c + 4d - 3a)$
8. $12f(5g - 4d + 3f)$
9. $3(7r + 17) + 19$
10. $9(8s - 10) + 60$

Exercise 4

Expand and Simplify the expressions:

1. $9(a + 3)$
2. $12(a - 3)$
3. $11(2a + 6)$
4. $13(4a - 3b)$
5. $20(7a + 3b) - 60b$
6. $5a(5b + 12c) + 40ac$
7. $10b(2c + 9d - 4a)$
8. $5f(12g - 5d + 5f)$
9. $17(4r + 3) - 50$
10. $6(6s - 11) + 60$

Exercise 1

Factorise the expressions:

1. $6a - 30$
2. $4b - 20$
3. $10c - 25$
4. $14d - 21$
5. $6e + 18$
6. $6f - 15$
7. $8g + 24$
8. $9h - 27j$
9. $10k - 50m$
10. $12n + 48p$

Exercise 2

Factorise the expressions:

1. $11a - 33$
2. $6b - 24$
3. $14c - 28$
4. $30d - 18$
5. $8e + 14$
6. $12f - 18$
7. $18g + 24$
8. $12h - 21j$
9. $50k - 200m$
10. $100n + 1000p$

Exercise 3

Factorise the expressions:

1. $35a - 40$
2. $25b - 50$
3. $39c - 13$
4. $36d - 54$
5. $14e + 42$
6. $6f - 60$
7. $12g + 60$
8. $56h - 72j$
9. $80k - 40m$
10. $18n + 54p$

Exercise 4

Factorise the expressions:

1. $9a - 30$
2. $7b - 42$
3. $14c - 35$
4. $18d - 30$
5. $36e + 18$
6. $40f - 24$
7. $18g + 81$
8. $1400h - 200j$
9. $22k - 121m$
10. $48n + 60p$

| | |
|--|--|
| <p>Exercise 1 Factorise the expressions:</p> <ol style="list-style-type: none">1. $2a^2 - 6a$2. $5b^2 + 20b$3. $10c - 10c^2$4. $8d^2 + 12d$5. $6e^2 + 10e$6. $5fg - 25fh$7. $8gh + 6g^2$8. $3bch - 27beh$9. $9klm - 12mnp$10. $12n^2pq + 15npq$ | <p>Exercise 2 Factorise the expressions:</p> <ol style="list-style-type: none">1. $28a - 4a^2$2. $5b^2 - 30b$3. $14c + 16c^2$4. $14d^2 - 21d$5. $18e + 14e^2$6. $35f^2 + 28f$7. $18gh + 12h^2$8. $12hs^2t - 21hs$9. $70kl^2m^2 - 200km$10. $45npq^2 + 36n^2p$ |
| <p>Exercise 3 Factorise the expressions:</p> <ol style="list-style-type: none">1. $9a^2 - 15a$2. $35b^2 + 7b$3. $8c - 20c^2$4. $18d^2 + 9d$5. $84e^2 + 21e$6. $12gh - 60fh$7. $21gh^2 + 9g^2$8. $24chj^2 - 27cjk$9. $66km^2p - 44mnp$10. $26n^2pq + 16npq^2$ | <p>Exercise 4 Factorise the expressions:</p> <ol style="list-style-type: none">1. $42a - 12a^2$2. $15b^2 - 65b$3. $18c + 16c^2$4. $15d^2 - 27d$5. $64e + 28e^2$6. $35f^2 + 42f$7. $50g^2h + 40gh^2$8. $35hs^2t - 21st^2$9. $110k^2lm^2 - 22klm$10. $60n^2pq^2 + 36n^2p^2q$ |

| | |
|----------------|-------------|
| E&F | Factorising |
|----------------|-------------|

Exercise 1

Simplify these expressions by collecting like terms:

1. $2a + a + 4a$
2. $3b + 2b + b - b$
3. $5a + 2a + 6a - 3a$
4. $4b + 2b - 3b + 7b$
5. $13a + 14a - 12a + 16a$
6. $3b + 3a + 6b$
7. $11a + 6b + 3a - b$
8. $8b + 9a - 5b + 15a$
9. $a + 7b - 2a - 4b$
10. $6b + a - 3b - 10a - 4b + 6a$

Exercise 2

Simplify these expressions by collecting like terms:

1. $a + 9a + a$
2. $4b + 5b + b - 2b$
3. $11a + 4a + 5a - 2a$
4. $7b + 8b - 7b + 2b$
5. $17a + 9a - 14a + 20a$
6. $15b + 16a + 9b$
7. $16a + 24b + 7a - 16b$
8. $4b + 6a - 8b + 21a$
9. $5a + 6b - 10a - 15b$
10. $9b + 2a - 3b - 8a - 22b + 14a$

Exercise 3

Simplify these expressions by collecting like terms:

1. $4a + 7a + 15a$
2. $7b + 7b + 7b - 8b$
3. $4a + 10a + 14a - 15a$
4. $9b + 3b - 13b + 10b$
5. $20a + 40a - 60a + 110a$
6. $18b + 12a + 19b$
7. $300a + 400b + 100a - 700b$
8. $5b + 6a - 13b + 19a$
9. $8a + 17b - 13a - 21b$
10. $8b + 2a - 6b - 8a - 14b + 20a$

Exercise 4

Simplify these expressions by collecting like terms:

1. $17a + 12a + 12a$
2. $6b + 6b + 6b - 24b$
3. $10a + 3a + a - 14a$
4. $5b + b - 6b + 4b$
5. $50a + 70a - 20a + 120a$
6. $6b + 10a + 19b$
7. $14a + 21b + 15a - 29b$
8. $31b + 20a - 22b + 34a$
9. $64a + 120b - 80a - 240b$
10. $30b + 8a - 4b - 16a - 12b + 70a$

Exercise 1

Simplify these expressions by collecting like terms:

1. $7t + 9g + 5t + 14g$
2. $15t + 21g + 12t + 32g$
3. $9g - 3t + 4g + 7t$
4. $3 + 2t - 6g + 5 - 4t + 3g$
5. $2t + 5t - g - 7g + 6t - 11g$
6. $3t + 9t^2 + 7t - 12t^2$
7. $4t^2 + 21g^2 - 13t^2 + 11g^2$
8. $6 + 5t + 17t^2 + 9 - 10t + 6t^2$
9. $-2g - 5t - 4g - 8 + 12t + 2g - 8$
10. $21t - 35g - 40t + 16 + 21g + 15t - 8$

Exercise 2

Simplify these expressions by collecting like terms:

1. $12t + 6g + 2t + 8g$
2. $22t + 33g + 11t + 48g$
3. $13g - 6t + 11g + 19t$
4. $5 + 6t - 3g + 2 - 7t + 18g$
5. $3t + 9t - g - 7g + 8t - 5g$
6. $4t + 10t^2 + 13t - 9t^2$
7. $3t^2 + 7g^2 - 3t^2 + 15g^2$
8. $17 + 11t + 14t^2 + 4 - 18t + 22t^2$
9. $-16g - 4t - 12g - 30 + 15t + 38g - 50$
10. $36t - 41g - 19t + 5 + 67g + 36t - 45$

Exercise 3

Simplify these expressions by collecting like terms:

1. $15t + 20g + 30t + 40g$
2. $13t + 56g + 49t + 31g$
3. $18g - 4t + 6g + 9t$
4. $6 + 3t - 14g + 8 - 5t + 2g$
5. $5t + 13t - 6g - 17g + 12t - 13g$
6. $2t + 3t^2 + t - t^2$
7. $30t^2 + 50g^2 - 35t^2 + 75g^2$
8. $18 + 7t + 13t^2 + 18 - 19t + 7t^2$
9. $-38g - 25t - 2g - 20 + 14t + 40g - 15$
10. $46t - 72g - 4t + 12 + 50g + 20t - 10$

Exercise 4

Simplify these expressions by collecting like terms:

1. $9t + 6g + 4t + 4g$
2. $17t + 13g + 16t + 23g$
3. $5g - 7t + 8g + 11t$
4. $9 + 4t - 2g + 7 - 8t + 7g$
5. $7t + 12t - 15g - 16g + 12t - 17g$
6. $7t + 6t^2 + 3t - 20t^2$
7. $40t^2 + 20g^2 - 19t^2 + 15g^2$
8. $19 + 6t + 23t^2 + 1 - 14t + 2t^2$
9. $-24g - 8t - 17g - 10 + 14t + 3g - 12$
10. $34t - 60g - 50t + 12 + 41g + 42t - 7$

Exercise 1

If $a = 3$, $b = 4$ and $c = -1$, find:

1. $3a + 3b$
2. $3c - 9a$
3. $b^2 + 10a$
4. $c^2 + a^2$
5. $3(a - b)$
6. $(a - c)^2$
7. $3ab$
8. $4a^2 + bc$
9. $(b + c)^2 + 5a^2$

Exercise 2

If $a = 4$, $b = 3$ and $c = -2$, find:

1. $3a + 2b$
2. $7c - a$
3. $2b^2 + 6b$
4. $c^2 + 4a$
5. $2(b - c)$
6. $(a - 2c)^2$
7. $10bc$
8. $3a(b + 2c)$
9. $(b + 3)^2 + 2a^2$

Exercise 3

If $a = 5$, $b = -3$ and $c = 6$, find:

1. $a + 8b$
2. $4c - 3b$
3. $3b^2 + 7a$
4. $c^2 - 4b$
5. $5(c + b)$
6. $6(a + b - c)$
7. $a(b - 2) + c$
8. $2b^2a + 2c$
9. $(b + 3c)^2 - 2a$

Exercise 4

If $a = 1$, $b = 4$ and $c = -5$, find:

1. $3a + 2b$
2. $3c - 2a$
3. $b + 8a^2$
4. $3c^2b$
5. $5(c - 2b)$
6. $b(a - 2c) + 2c$
7. $6ac$
8. $5c + ba^2$
9. $(2b - c)^2 + 3b$

Exercise 1

If $a = 6$, $b = 5$ and $c = -3$, find:

1. $5a + 3b$
2. $6c - 9a + b$
3. $b^2 + 3a - c$
4. $c^2 + 2a^2$
5. $3(a - b + c)$
6. $(a - c)^2$
7. $4ac$
8. $3a^2 + 5c$
9. $(b + c)^2 + 7a^2$

Exercise 2

If $a = 5$, $b = -2$ and $c = -1$, find:

1. $3a + 5b$
2. $2c - 3a$
3. $4b^2 - 3b$
4. $4c^2 + 2a$
5. $4(b - c - a)$
6. $(a - 2c)^2$
7. $8ab$
8. $7a(b + 2c)$
9. $(b - 3)^2 + 4a^2$

Exercise 3

If $a = 3$, $b = -5$ and $c = -4$, find:

1. $4a + 2b$
2. $4c - 5b - a$
3. $2b^2 + 3a - c$
4. $3c^2 - 2b$
5. $5(c + b - c)$
6. $7(a - b + c)$
7. $a(b - 2) - c$
8. $3b^2a - 2c$
9. $(b - 3c)^2 - 4a$

Exercise 4

If $a = 8$, $b = -3$ and $c = -4$, find:

1. $4a - 2b$
2. $5c - 10a$
3. $b + 8a^2$
4. $4c^2b$
5. $3(c - 2a)$
6. $b(a - c) + 2b$
7. $9ac$
8. $3c + ba^2$
9. $(2b - c)^2 + 4b$

E&F

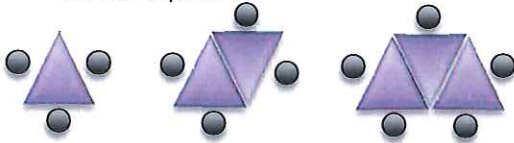
Substitution

Exercise 1

1. (a) Write the next three numbers in each of the sequences and (b) find a rule for the n th term.
 (i) 5, 12, 19...
 (ii) 37, 49, 61...
 (iii) 120, 240, 360

2.

- (a) Write down the number of dots for the next three sequences.



- (b) Find a rule connecting the number of dots (D) to the number of triangles (T).

- (c) Use the rule to find how many dots there would be for 15 triangles.

Exercise 2

1. (a) Write the next three numbers in each of the sequences and (b) find a rule for the n th term.
 (i) 16, 46, 75...
 (ii) 80, 87, 95...
 (iii) 2010, 4020, 6030

2.

- (a) Write down the number of dots for the next three sequences.



- (b) Find a rule connecting the number of dots (D) to the number of squares (S).

- (c) Use the rule to find how many dots there would be for 20 squares.

Exercise 3

1. (a) Write the next three numbers in each of the sequences and (b) find a rule for the n th term.
 (i) 19, 41, 63...
 (ii) 49, 90, 131, ...
 (iii) -23, -15, -7...

2.

- (a) Write down the number of dots for the next three sequences.



- (b) Find a rule connecting the number of dots (D) to the number of Pentagons (P).

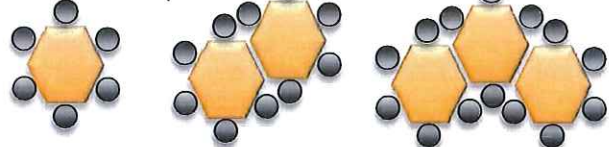
- (c) Use the rule to find how many dots there would be for 22 pentagons.

Exercise 4

1. (a) Write the next three numbers in each of the sequences and (b) find a rule for the n th term.
 (i) 53, 107, 161...
 (ii) 29, 72, 115...
 (iii) -100, -15, 70

2.

- (a) Write down the number of dots for the next three sequences.



- (b) Find a rule connecting the number of dots (D) to the number of hexagons (H).

- (c) Use the rule to find how many dots there would be for 25 hexagons.

Exercise 1

1.

| | | | | | |
|---|---|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 7 | 10 | 13 | | |

2.

| | | | | | |
|---|---|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 4 | 13 | 22 | | |

3.

| | | | | | |
|---|---|---|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 1 | 9 | 17 | | |

4.

| | | | | | |
|---|---|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 6 | 17 | 28 | | |

For each of the tables above:

- Copy and complete the table
- Find a formula connecting P to Q
- Use your formula to find Q when P is 16

Exercise 2

1.

| | | | | | |
|---|----|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 15 | 21 | 27 | | |

2.

| | | | | | |
|---|---|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 3 | 15 | 27 | | |

3.

| | | | | | |
|---|----|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 12 | 25 | 38 | | |

4.

| | | | | | |
|---|---|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 5 | 19 | 33 | | |

For each of the tables above:

- Copy and complete the table
- Find a formula connecting P to Q
- Use your formula to find Q when P is 16

Exercise 3

1.

| | | | | | |
|---|----|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 10 | 22 | 34 | | |

2.

| | | | | | |
|---|----|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 43 | 51 | 59 | | |

3.

| | | | | | |
|---|----|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 13 | 16 | 19 | | |

4.

| | | | | | |
|---|----|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 68 | 79 | 90 | | |

For each of the tables above:

- Copy and complete the table
- Find a formula connecting P to Q
- Use your formula to find Q when P is 16

Exercise 4

1.

| | | | | | |
|---|---|----|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 2 | 22 | 42 | | |

2.

| | | | | | |
|---|---|---|---|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | 0 | 4 | 8 | | |

3.

| | | | | | |
|---|----|---|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | -4 | 5 | 14 | | |

4.

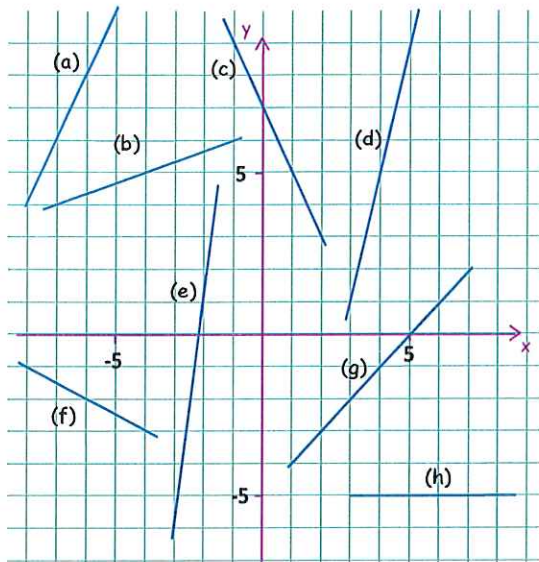
| | | | | | |
|---|-----|---|----|---|---|
| P | 1 | 2 | 3 | 4 | 5 |
| Q | -10 | 2 | 14 | | |

For each of the tables above:

- Copy and complete the table
- Find a formula connecting P to Q
- Use your formula to find Q when P is 16

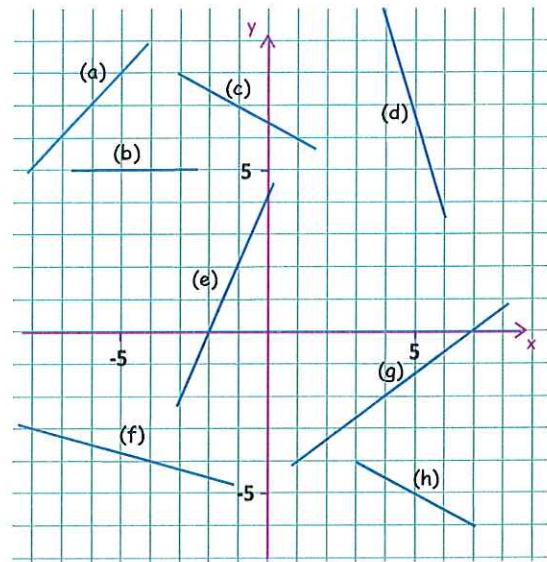
Exercise 1

Use the gradient formula, $\text{gradient} = \frac{\text{vertical}}{\text{horizontal}}$ to calculate the gradient of these lines:



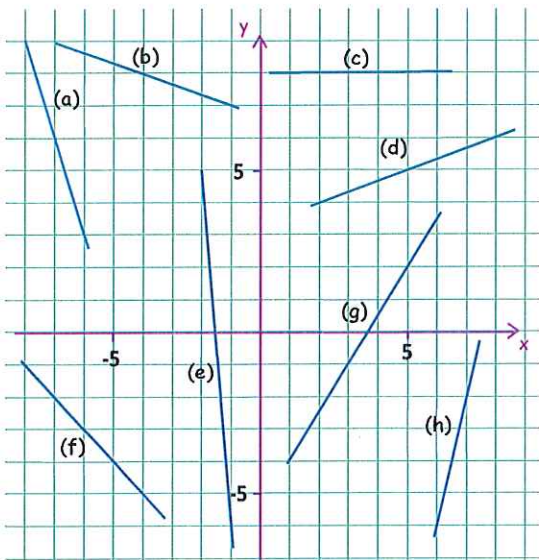
Exercise 2

Use the gradient formula, $\text{gradient} = \frac{\text{vertical}}{\text{horizontal}}$ to calculate the gradient of these lines:



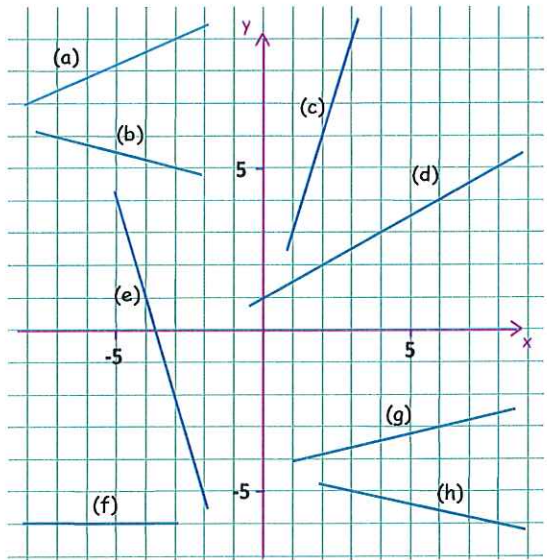
Exercise 3

Use the gradient formula, $\text{gradient} = \frac{\text{vertical}}{\text{horizontal}}$ to calculate the gradient of these lines:



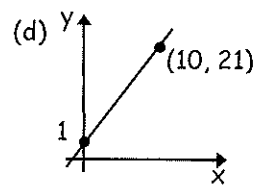
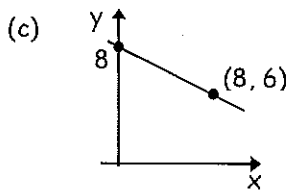
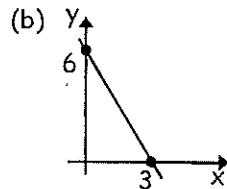
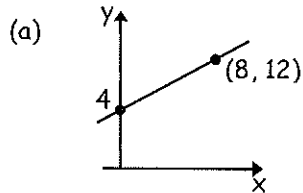
Exercise 4

Use the gradient formula, $\text{gradient} = \frac{\text{vertical}}{\text{horizontal}}$ to calculate the gradient of these lines:



Exercise 1

1. Use the gradient formula, $m = \frac{Y_2 - Y_1}{X_2 - X_1}$ to find the gradient of these lines:

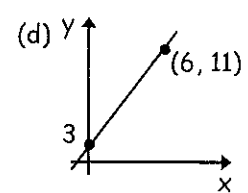
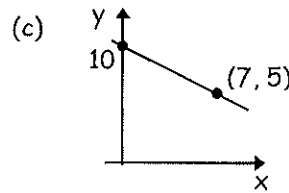
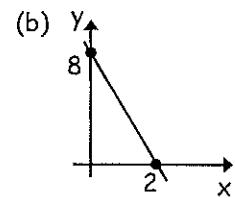
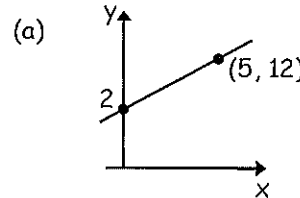


2. Find the gradient between these two points:

- (a) (2, 13) and (14, 37) (b) (1, 0) and (6, -15)
(c) (-8, 6) and (2, -14) (d) (-5, -2) and (0, -8)

Exercise 2

1. Use the gradient formula, $m = \frac{Y_2 - Y_1}{X_2 - X_1}$ to find the gradient of these lines:

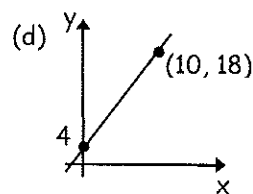
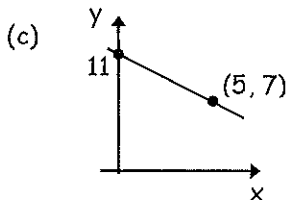
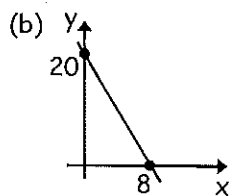
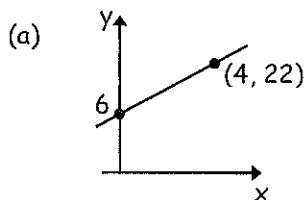


2. Find the gradient between these two points:

- (a) (6, 4) and (12, 40) (b) (4, 0) and (6, -18)
(c) (-10, 2) and (2, -22) (d) (-3, -5) and (0, -9)

Exercise 3

1. Use the gradient formula, $m = \frac{Y_2 - Y_1}{X_2 - X_1}$ to find the gradient of these lines:

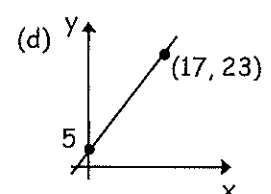
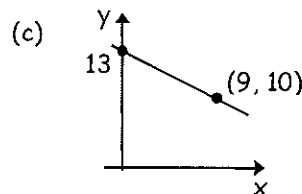
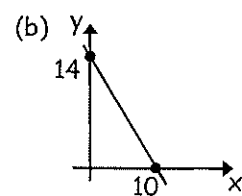
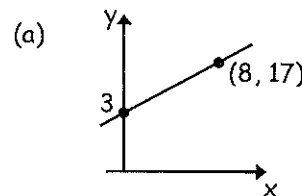


2. Find the gradient between these two points:

- (a) (5, 15) and (10, 35) (b) (9, 0) and (4, -20)
(c) (-3, 6) and (7, -34) (d) (-7, -1) and (0, -5)

Exercise 4

1. Use the gradient formula, $m = \frac{Y_2 - Y_1}{X_2 - X_1}$ to find the gradient of these lines:



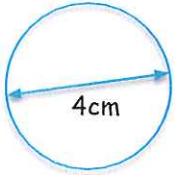
2. Find the gradient between these two points:

- (a) (10, 20) and (30, 60) (b) (4, 4) and (-5, -5)
(c) (-3, 4) and (17, -56) (d) (6, -3) and (0, -11)

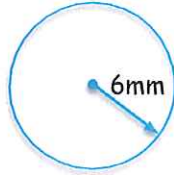
Exercise 1

Find (a) the area and (b) the circumference of each of the following circles:

1.



2.



3.



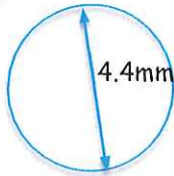
4.



5.



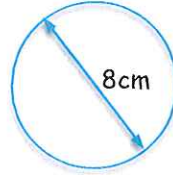
6.



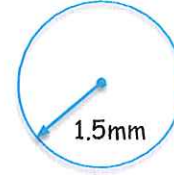
Exercise 2

Find (a) the area and (b) the circumference of each of the following circles:

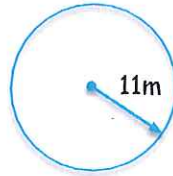
1.



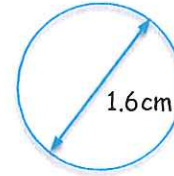
2.



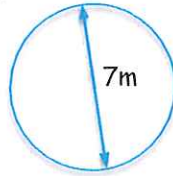
3.



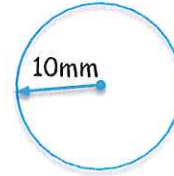
4.



5.



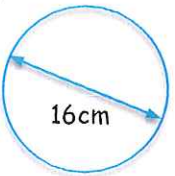
6.



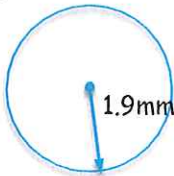
Exercise 3

Find (a) the area and (b) the circumference of each of the following circles:

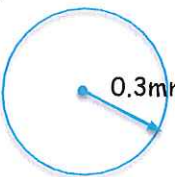
1.



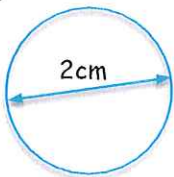
2.



3.



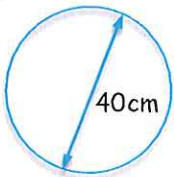
4.



5.



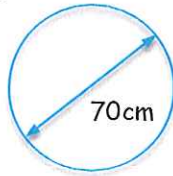
6.



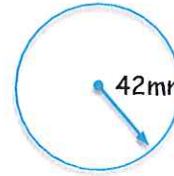
Exercise 4

Find (a) the area and (b) the circumference of each of the following circles:

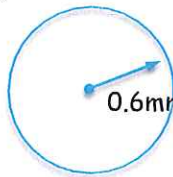
1.



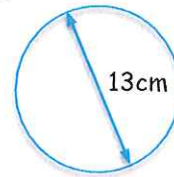
2.



3.



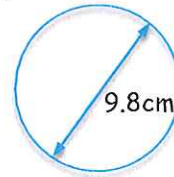
4.



5.

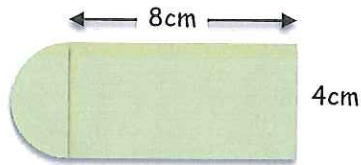


6.

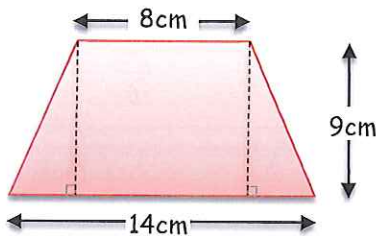


Exercise 1

1. Find the area of the composite shape:

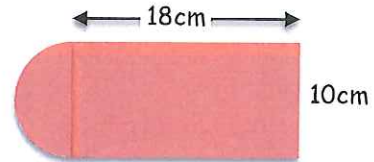


2. The trapezium is made up of a rectangle and two identical right-angled triangles. Find the area of the shape.

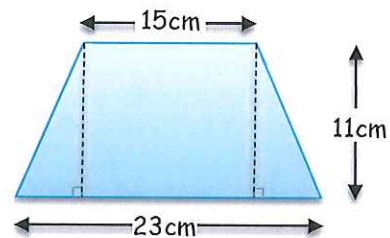


Exercise 2

1. Find the area of the composite shape:

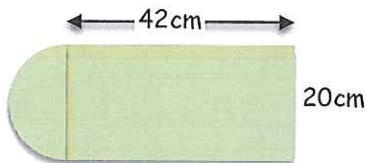


2. The trapezium is made up of a rectangle and two identical right-angled triangles. Find the area of the shape.

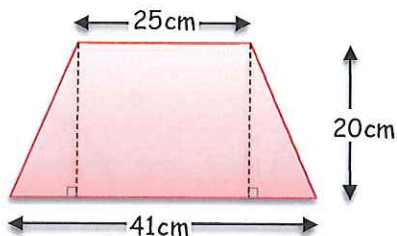


Exercise 3

1. Find the area of the composite shape:

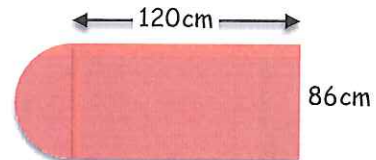


2. The trapezium is made up of a rectangle and two identical right-angled triangles. Find the area of the shape.

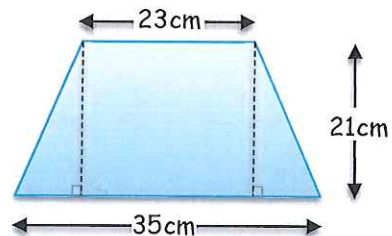


Exercise 4

1. Find the area of the composite shape:



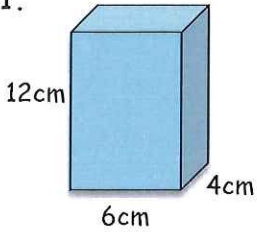
2. The trapezium is made up of a rectangle and two identical right-angled triangles. Find the area of the shape.



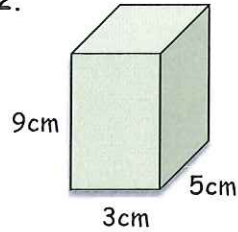
Exercise 1

Find the surface area of the cuboids:

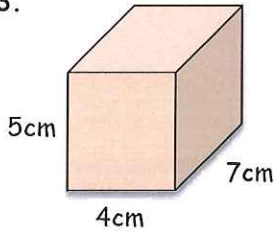
1.



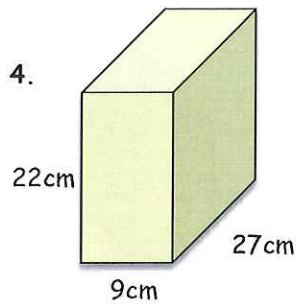
2.



3.



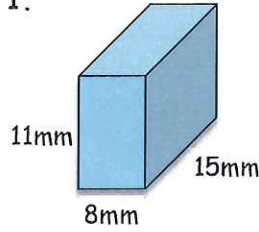
4.



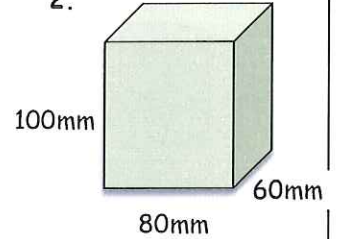
Exercise 2

Find the surface area of the cuboids:

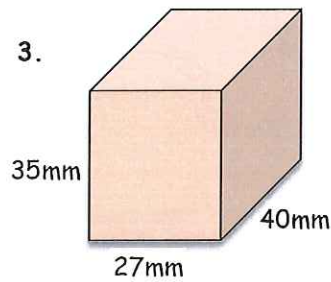
1.



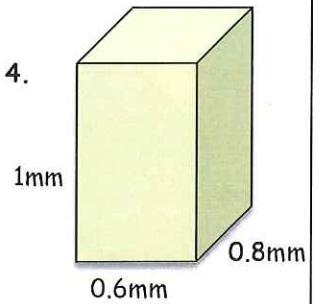
2.



3.



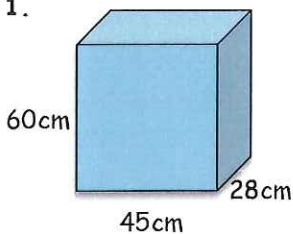
4.



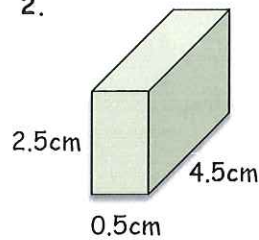
Exercise 3

Find the surface area of the cuboids:

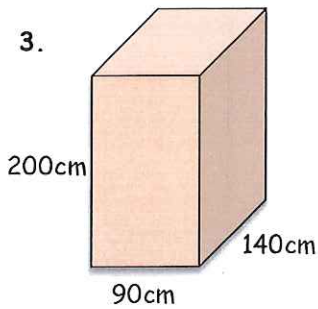
1.



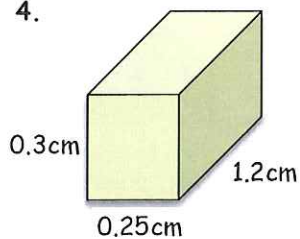
2.



3.



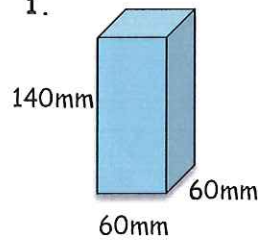
4.



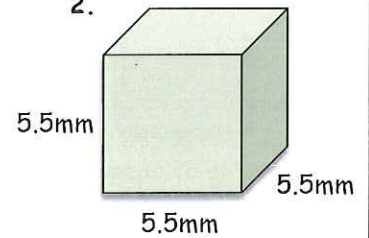
Exercise 4

Find the surface area of the cuboids:

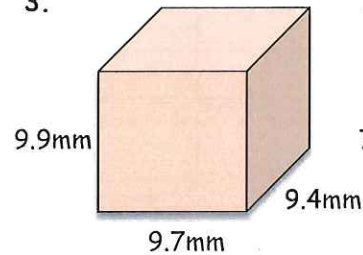
1.



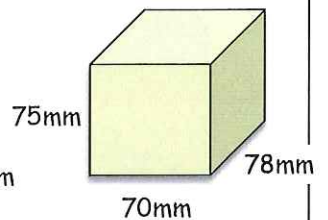
2.



3.



4.

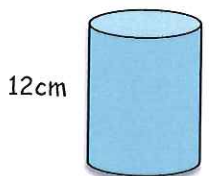


| | |
|-----|--------------|
| E&F | Surface Area |
|-----|--------------|

Exercise 1

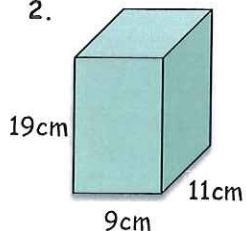
Find the volume of the prisms:

1.



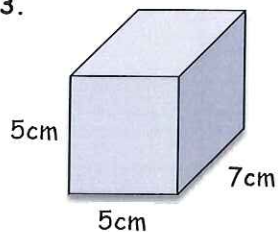
Area of base
= 18cm^2

2.



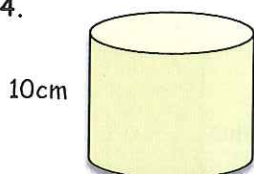
9cm

3.



5cm

4.

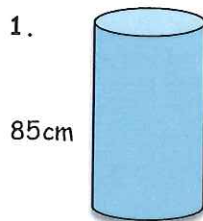


Area of base
= 72cm^2

Exercise 2

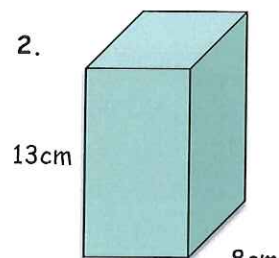
Find the volume of the prisms:

1.



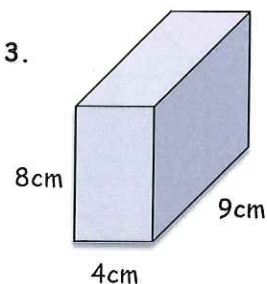
Area of base
= 30cm^2

2.



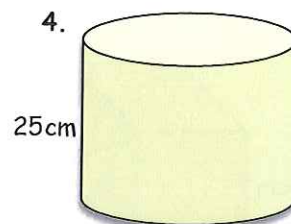
5cm

3.



4cm

4.

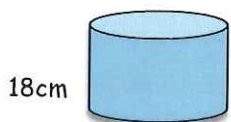


Area of base
= 90cm^2

Exercise 3

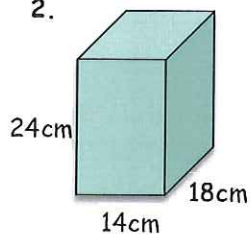
Find the volume of the prisms:

1.



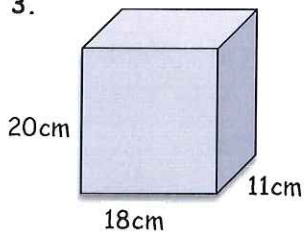
Area of base
= 50cm^2

2.



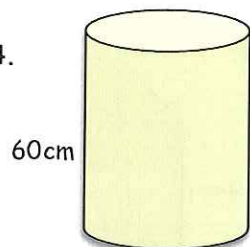
14cm

3.



18cm

4.

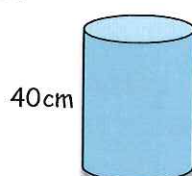


Area of base
= 110cm^2

Exercise 4

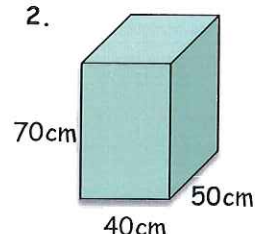
Find the volume of the prisms:

1.



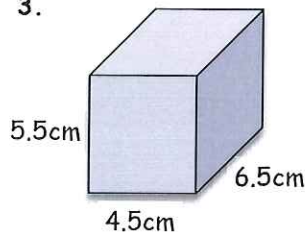
Area of base
= 200cm^2

2.



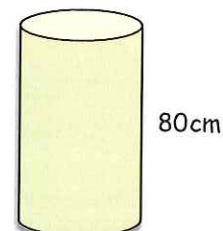
40cm

3.



4.5cm

4.



Area of base
= 300cm^2

Exercise 1

Find the Mean, Median, Mode and Range for the numbers below:

1. 3, 3, 4, 7, 8
2. 6, 8, 11, 11, 13, 17
3. 5, 6, 4, 3, 4, 3, 3, 4, 3, 5
4. 30, 10, 40, 60, 50, 40, 50
5. 0.2, 0.3, 0.3, 0.5, 0.2, 0.3
6. 1.9, 1.4, 2.1, 2.3, 1.6, 1.4, 1.8, 1.9
7. -4, 0, 5, 11
8. -12, -10, -2, 6, 8

Exercise 2

Find the Mean, Median, Mode and Range for the numbers below:

1. 8, 8, 8, 10, 11
2. 3, 9, 11, 14, 17, 18
3. 2, 1, 2, 1, 1, 1, 2, 1, 2, 1
4. 50, 30, 50, 50, 50, 20, 50, 20
5. 0.25, 0.25, 0.20, 0.5, 0.25, 0.8, 0.6, 0.35
6. 1.4, 1.1, 1.4, 1.3, 1.4, 1.8
7. -10, -6, -6, 0, 2
8. -140, -80, -60, -40, -40, 0

Exercise 3

Find the Mean, Median, Mode and Range for the numbers below:

1. 14, 16, 17, 19, 19
2. 4, 7, 8, 12, 14, 19, 20
3. 7, 8, 8, 8, 9, 11, 11, 12, 13, 14
4. 90, 20, 40, 50, 20, 80
5. 0.02, 0.02, 0.05, 0.02, 0.04
6. 1, 2, 2, 3, 4, 5, 5, 5, 5, 6, 6, 6, 7, 8, 10
7. -8, -6, -6, 0, 1, 7
8. -100, -80, -60, -50, -10, 20, 70

Exercise 4

Find the Mean, Median, Mode and Range for the numbers below:

1. 25, 35, 40, 50, 60
2. 3, 8, 12, 13, 22, 22, 25
3. 7, 8, 8, 8, 9, 13, 16, 17, 18, 20
4. 100, 30, 50, 40, 60, 50
5. 1.01, 1.02, 1.02, 1.03
6. 0, 2, 2, 2, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5
7. 10, -12, 6, -8, 4
8. -70, -80, -20, -40, -70

E&F

Mean, Median, Mode, Range

Exercise 1

1. When rolling a die, what is the probability of rolling a four?
2. When rolling a die, what is the probability of rolling an even number?
3. In a deck of 52 cards, what is the probability of picking a diamond?
4. In a deck of cards, what is the probability of picking a king?
5. If there are 5 red balls, 3 blue balls and 7 green balls in a bag, what is the probability of picking a red ball?
6. If there are 11 red balls, 7 blue balls and 6 green balls in a bag, what is the probability of not picking a red ball?

Exercise 2

1. When rolling a die, what is the probability of rolling a 3?
2. When rolling a die, what is the probability of rolling an odd number?
3. In a deck of 52 cards, what is the probability of picking a spade less than 6? (Count an ace as 1)
4. In a deck of cards, what is the probability of picking a red man?
5. If there are 4 red balls, 4 blue balls and 1 green balls in a bag, what is the probability of picking a blue ball?
6. If there are 15 red balls, 12 blue balls and 18 green balls in a bag, what is the probability of not picking a green ball?

Exercise 3


1. When rolling a die, what is the probability of rolling a number less than four?
2. When rolling a die, what is the probability of rolling an even number less than 6?
3. In a deck of 52 cards, what is the probability of picking a diamond more than 5?
4. In a deck of cards, what is the probability of picking a red even number?
5. If there are 20 red balls, 23 blue balls and 27 green balls in a bag, what is the probability of picking a green ball?
6. If there are 31 red balls, 27 blue balls and 16 green balls in a bag, what is the probability of not picking a blue ball?


Exercise 4


1. When rolling a die, what is the probability of rolling a number more than 2?
2. When rolling a die, what is the probability of rolling an odd number more than 5?
3. In a deck of 52 cards, what is the probability of picking a red number more than 8?
4. In a deck of cards, what is the probability of picking a male spade?
5. If there are 50 red balls, 15 blue balls and 17 green balls in a bag, what is the probability of picking a red ball?
6. If there are 7 red balls, 9 blue balls and 58 green balls in a bag, what is the probability of not picking a green ball?

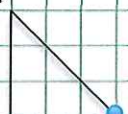
Exercise 1

Copy and complete each of the shapes so that they have rotational symmetry of order 2

1. 


2. 


3. 


4. 


Exercise 2

Copy and complete each of the shapes so that they have rotational symmetry of order 4

1. 


2. 


3. 

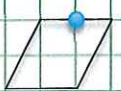
4. 

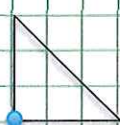
Exercise 3

Copy and complete each of the shapes so that they have rotational symmetry of order 2

1. 


2. 


3. 


4. 

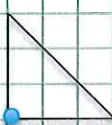
Exercise 4

Copy and complete each of the shapes so that they have rotational symmetry of order 4

1. 

2. 

3. 

4. 

Exercise 1

1. (a) Expand the brackets: $5(2x - 4)$

(b) Expand the brackets and simplify:
 $2(3y + 4) - 3y$
2. Factorise: $6a - 18$
3. Simplify: $7s + 2r - 4s + r$
4. (a) When $a = 5$ and $b = 2$, find $8a - 3b$

(b) John manufactures bicycle parts, his pay is calculated using the formula:
 $P = 3.5H + 2B$
Where P is his pay, H is the number of hours he works and B is the number of parts he makes.

One week he works 40 hours and makes 50 parts, calculate his pay for that week.

Exercise 2

1. (a) Expand the brackets: $7(3x + 5)$

(b) Expand the brackets and simplify:
 $4(5y - 7) + 8y$
2. Factorise: $8a - 32$
3. Simplify: $9s + 4r - 7s + 6r$
4. (a) When $a = 2$ and $b = 8$, find $4a - 5b$

(b) John manufactures bicycle parts, his pay is calculated using the formula:
 $P = 3H + 2.5B$
Where P is his pay, H is the number of hours he works and B is the number of parts he makes.

One week he works 20 hours and makes 25 parts, calculate his pay for that week.

Exercise 3

1. (a) Expand the brackets: $8(5x - 3)$

(b) Expand the brackets and simplify:
 $6(2y - 8) + 9y$
2. Factorise: $5a - 30$
3. Simplify: $8s + 6r - 7s + 12r$
4. (a) When $a = 6$ and $b = 7$, find $4a + 2b$

(b) John manufactures bicycle parts, his pay is calculated using the formula:
 $P = 4H + 1.5B$
Where P is his pay, H is the number of hours he works and B is the number of parts he makes.

One week he works 30 hours and makes 40 parts, calculate his pay for that week.

Exercise 4

1. (a) Expand the brackets: $9(3x + 4)$

(b) Expand the brackets and simplify:
 $7(3y + 6) - 12y$
2. Factorise: $9a - 36$
3. Simplify: $10s + 13r - 9s + 15r$
4. (a) When $a = 9$ and $b = 3$, find $7a - 4b$

(b) John manufactures bicycle parts, his pay is calculated using the formula:
 $P = 3.5H + 1.5B$
Where P is his pay, H is the number of hours he works and B is the number of parts he makes.

One week he works 34 hours and makes 60 parts, calculate his pay for that week.

Exercise 1

1. The diagrams below show the number of seats at a table groups



(d) Copy and complete the table

| | | | | | | |
|----------------------|---|---|---|---|--|---|
| Number of tables (T) | 1 | 2 | 3 | 4 | | 9 |
| Number of Chairs (C) | | | | | | |

(e) Write down a formula connecting number of chairs (C) to number of tables (T).

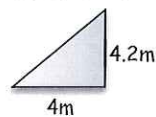
(f) A table group has 60 chairs, how many tables does it have?

3. The picture represents a roof cross-section. The roof must not have a gradient greater than 1.02.

(a) Calculate the gradient.

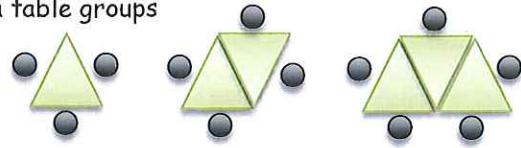
(b) Does it meet the requirements?

You must give a reason.



Exercise 2

1. The diagrams below show the number of seats at a table groups



(a) Copy and complete the table

| | | | | | | |
|----------------------|---|---|---|---|--|---|
| Number of tables (T) | 1 | 2 | 3 | 4 | | 9 |
| Number of Chairs (C) | | | | | | |

(b) Write down a formula connecting number of chairs (C) to number of tables (T).

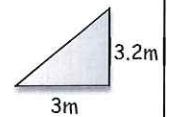
(c) A table group has 57 chairs, how many tables does it have?

2. The picture represents a roof cross-section. The roof must not have a gradient greater than 1.1.

(a) Calculate the gradient.

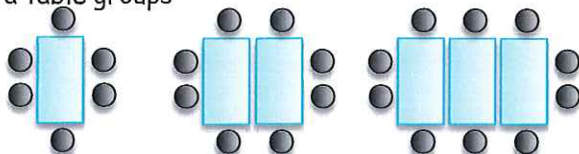
(b) Does it meet the requirements?

You must give a reason.



Exercise 3

1. The diagrams below show the number of seats at a table groups



(a) Copy and complete the table

| | | | | | | |
|----------------------|---|---|---|---|--|---|
| Number of tables (T) | 1 | 2 | 3 | 4 | | 9 |
| Number of Chairs (C) | | | | | | |

(b) Write down a formula connecting number of chairs (C) to number of tables (T).

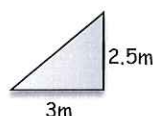
(c) A table group has 50 chairs, how many tables does it have?

2. The picture represents a roof cross-section. The roof must not have a gradient greater than 0.9.

(a) Calculate the gradient.

(b) Does it meet the requirements?

You must give a reason.



Exercise 4

1. The diagrams below show the number of seats at a table groups



(a) Copy and complete the table

| | | | | | | |
|----------------------|---|---|---|---|--|---|
| Number of tables (T) | 1 | 2 | 3 | 4 | | 9 |
| Number of Chairs (C) | | | | | | |

(b) Write down a formula connecting number of chairs (C) to number of tables (T).

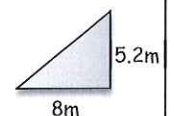
(c) A table group has 122 chairs, how many tables does it have?

2. The picture represents a roof cross-section. The roof must not have a gradient greater than 0.6.

(a) Calculate the gradient.

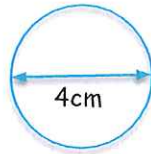
(b) Does it meet the requirements?

You must give a reason.

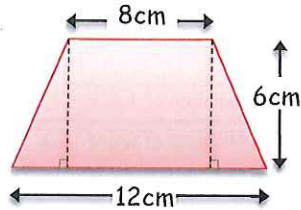


Exercise 1

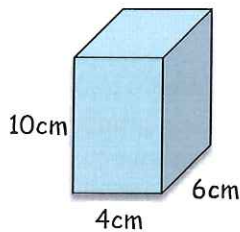
1. Find (a) the area and (b) the circumference of each of the following circles:



2. The trapezium is made up of a rectangle and two identical right-angled triangles. Find the area of the shape.



3. Find the surface area of the shape:

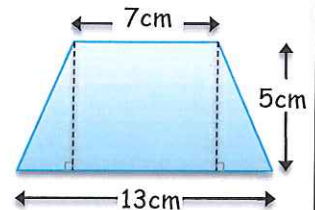


Exercise 2

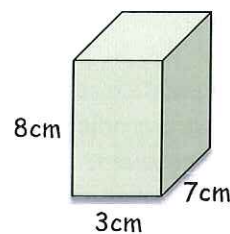
1. Find (a) the area and (b) the circumference of each of the following circles:



2. The trapezium is made up of a rectangle and two identical right-angled triangles. Find the area of the shape.

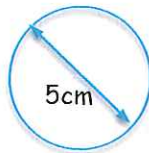


3. Find the surface area of the shape:

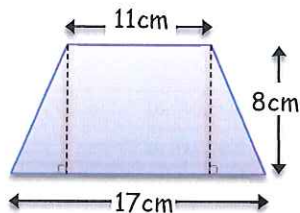


Exercise 3

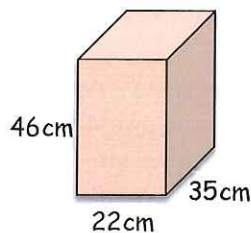
1. Find (a) the area and (b) the circumference of each of the following circles:



2. The trapezium is made up of a rectangle and two identical right-angled triangles. Find the area of the shape.



3. Find the surface area of the shape:

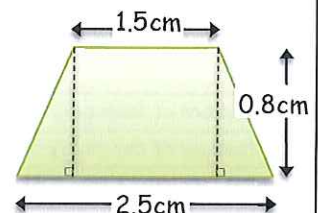


Exercise 4

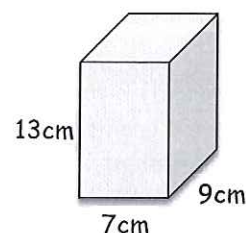
1. Find (a) the area and (b) the circumference of each of the following circles:



2. The trapezium is made up of a rectangle and two identical right-angled triangles. Find the area of the shape.

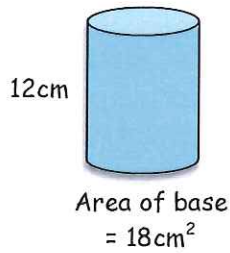


3. Find the surface area of the shape:



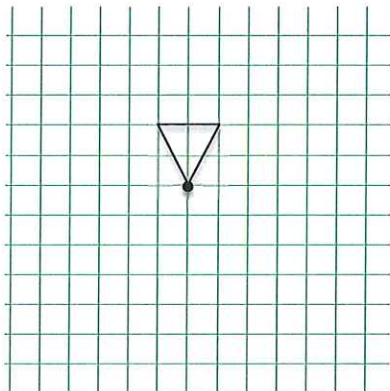
Exercise 1

- Find the volume of the prism:



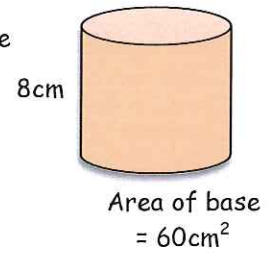
- Find the Mean, Median, Mode and Range for the following numbers: 6, 5, 7, 9, 10

- Complete the shape so that it has rotation symmetry of order 4:



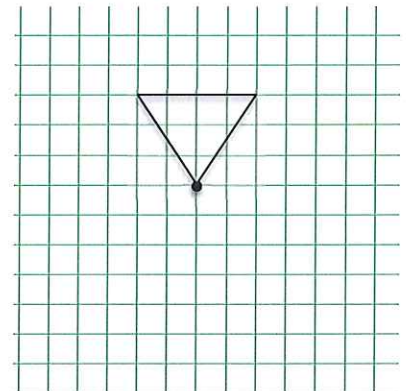
Exercise 2

- Find the volume of the prism:



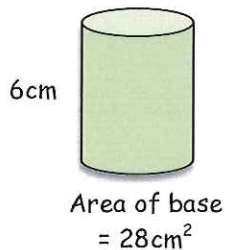
- Find the Mean, Median, Mode and Range for the following numbers: 11, 10, 9, 11, 12

- Complete the shape so that it has rotation symmetry of order 4:



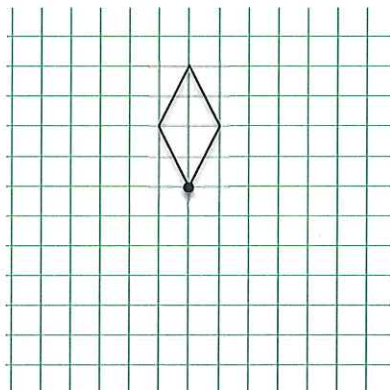
Exercise 3

- Find the volume of the prism:



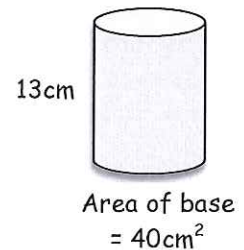
- Find the Mean, Median, Mode and Range for the following numbers: 5, 9, 4, 10, 7, 4, 2

- Complete the shape so that it has rotation symmetry of order 4:



Exercise 4

- Find the volume of the prism:



- Find the Mean, Median, Mode and Range for the following numbers: 0.2, 0.4, 0.6, 0.1, 0.9, 1.2

- Complete the shape so that it has rotation symmetry of order 4:

