

Year 8 Mathematics Revision Booklet



الأكاديمية الإسلامية البريطانية
BRITISH ISLAMIC
ACADEMY

Name:.....

UNIT 12 *Formulae*

Extra Exercises 12.1

1. If $x = 6$, $y = 7$ and $z = 8$, evaluate the following expressions:

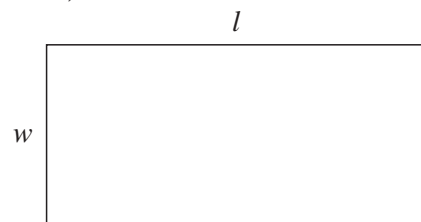
- | | | |
|-----------------|-----------------|-------------|
| (a) $x + y$ | (b) $z - x$ | (c) $z + y$ |
| (d) $2x$ | (e) $3y$ | (f) $4z$ |
| (g) $x + y + z$ | (h) $x + y - z$ | (i) $z - y$ |

2. Calculate the values of the following expressions, if $a = 3$, $b = 7$ and $c = 5$.

- | | | |
|---------------|---------------|---------------|
| (a) ab | (b) bc | (c) ac |
| (d) $2a + b$ | (e) $2b + c$ | (f) $3c + a$ |
| (g) $2b + 2c$ | (h) $3a + 7b$ | (i) $5b - 6c$ |
| (j) $6b + 3c$ | (k) $3b - 2c$ | (l) $6a - 2b$ |

3. Calculate the area and perimeter of the rectangle shown, if:

- (a) $l = 6$ and $w = 2$,
(b) $l = 8$ and $w = 5$,
(c) $l = 13$ and $w = 6$.



1. Calculate:

(a) $3 - 8$

(b) $(-5) + 8$

(c) $3 - (-5)$

(d) $30 + (-5)$

(e) $(-4) \times (-8)$

(f) $(-2) \times (-6)$

(g) $5 \times (-7)$

(h) $(-4) - (-8)$

(i) $8 - (-4)$

(j) $24 \div (-6)$

(k) $(-20) \div (-4)$

(l) $100 \div (-5)$

2. If $x = 8$, $y = 4$ and $z = -2$, calculate the values of the following expressions:

(a) $x + z$

(b) $x - z$

(c) xz

(d) $\frac{x}{z}$

(e) xyz

(f) $xy + 3z$

(g) $2x - 5y$

(h) $4z + 8y$

(i) $5x + 2z$

3. If $a = 4$, $b = 5$ and $c = -10$, calculate the values of the following expressions:

(a) $3(a + b)$

(b) $4(b - a)$

(c) $2(a + c)$

(d) a^2

(e) b^2

(f) c^2

(g) $a^2 + c$

(h) $a^2 + b^2$

(i) $\sqrt{a + b}$

(j) $\sqrt{3b - c}$

(k) $\frac{ab}{c}$

(l) $\frac{ab + c}{b}$

1. Solve the following equations

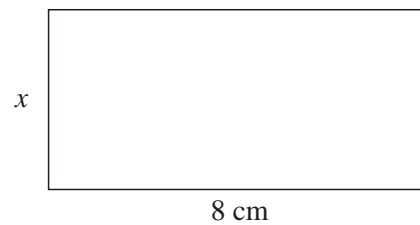
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|------------------------|-----------------------|------------------|
| (a) $3 + x = 8$ | (b) $5x = 40$ | (c) $x - 2 = 6$ |
| (d) $\frac{x}{2} = 14$ | (e) $2x = 14$ | (f) $3 + x = 15$ |
| (g) $x - 1 = 9$ | (h) $x - 4 = 12$ | (i) $3x = 27$ |
| (j) $5x = 45$ | (k) $\frac{x}{3} = 6$ | (l) $4x = 32$ |
| (m) $x - 2 = 3$ | (n) $6x = 42$ | (o) $x - 7 = 21$ |

2. Solve the following equations:

- | | | |
|-----------------|------------------|------------------------|
| (a) $3x = -12$ | (b) $2x = -40$ | (c) $\frac{x}{-2} = 8$ |
| (d) $x + 4 = 2$ | (e) $x - 3 = -2$ | (f) $x + 8 = 3$ |

3. The area of the rectangle shown is 24 cm^2 .

- (a) Write down an equation involving x .
 (b) Calculate the value of x .



1. Solve the following equations:

(a) $5x + 2 = 12$

(b) $6x - 3 = 21$

(c) $4x + 1 = 13$

(d) $2x + 7 = 21$

(e) $5x - 8 = 22$

(f) $4x + 1 = -7$

(g) $5x + 13 = 3$

(h) $4(x - 7) = 8$

(i) $3(2x + 7) = 27$

(j) $\frac{x}{4} + 2 = 5$

(k) $\frac{x + 2}{3} = 8$

(l) $\frac{2x + 6}{3} = 8$

2. Solve the following equations:

(a) $x + 2 = 2x - 1$

(b) $6x - 1 = 2x + 23$

(c) $4x + 2 = 5x + 1$

(d) $3x + 2 = 5x - 8$

(e) $3(2x + 1) = 4x + 19$

(f) $7x + 4 = 3(x + 8)$

3. A formula states:

$$s = \frac{1}{2}(u + v)t$$

(a) Calculate s , if $u = 3$, $v = 6$ and $t = 10$.

(b) Calculate t , if $s = 8$, $u = 1$ and $v = 3$.

(c) Calculate u , if $s = 52$, $v = 5$ and $t = 8$.

(d) Calculate v , if $s = 4$, $u = 6$ and $t = 8$.

1. Complete the following table to solve the equation $x^3 = 100$, giving your answer correct to 1 decimal place.

x	x^3	<i>Comment</i>
4		
5		
4.5		
4.6		
4.7		
4.65		

2. Solve the equation

$$x^2 + x^3 = 50$$

giving your answer correct to:

- (a) 1 decimal place,
 - (b) 2 decimal places.
3. Solve the equation

$$x + x^4 = 200$$

giving your answer correct to 2 decimal places.

1. Make x the subject of each of the following formulae:

(a) $y = 4x$ (b) $y = x + 4$ (c) $y = \frac{x}{6}$

(d) $y = x - 7$ (e) $y = 2x + 1$ (f) $y = 3(x + 2)$

(g) $y = 4(x - 6)$ (h) $y = \frac{x}{2} + 1$ (i) $y = 4x - 8$

2. Make t the subject of each of the following formulae:

(a) $x = 4t + p$ (b) $x = bt - a$ (c) $y = xt + p$

(d) $p = \frac{t}{2} + a$ (e) $q = \frac{t}{x} - b$ (f) $p = 2(t + r)$

3. The formula $p = \frac{22k}{10}$ can be used to convert kilograms to pounds. Make k the subject of this formula.

4. The cost, C , of a taxi journey is calculated using the formula

$$C = 1.8 + 2d$$

where d is the distance travelled, in miles. Make d the subject of this formula.

1. The prices of some items at a shop are shown on the list. Three boys go to the shop, each with a £2 coin to spend. How much change do they each get if they buy the following items:

<i>Packet of crisps</i>	30p
<i>Can of drink</i>	55p
<i>Chocolate bar</i>	37p
<i>Packet of mints</i>	29p

Adam : packet of crisps, can of drink and a packet of mints

Ian : chocolate bar and 2 packets of mints

Tom : can of drink, packet of crisps and 2 chocolate bars

2. A burger meal costs £3.79. Mr Jenkin buys 3 of these meals.
- How much does he have to pay?
 - How much change should he get from a £20 note?
3. At a swimming pool the entry charge is £1.25 for adults and 87p for children. Calculate the total cost for:
- 2 adults and 4 children,
 - 1 adult and 3 children.
4. A jumble sale raises £460. This is divided equally between 4 different charities. How much is given to each charity?
5. Packets of sweets cost 40p each. How many packets of sweets can you buy with:
- £2
 - £3.60
 - £10 ?

1. Convert the following times to 24-hour clock times:
(a) 3:15 p.m. (b) 7:40 a.m. (c) 6:20 a.m.
(d) 11:22 p.m. (e) 10:42 p.m. (f) 9:26 p.m.

2. Write the following 24-hour clock times as 12-hour clock times, using 'a.m.' or 'p.m.'
(a) 0712 (b) 1926 (c) 1814
(d) 0805 (e) 1111 (f) 2212

3. A journey takes $4\frac{1}{2}$ hours. At what time will the journey be completed if it is started at:
(a) 0730 (b) 0942 (c) 1126

4. Rachel leaves home at 0805 and arrives at school at 0852. How long did it take her to get to school?

5. A train leaves Birmingham at 1307 and arrives in Bristol at 1446. How long does the journey take?

6. A coach journey takes 3 hours and 25 minutes. The coach leaves at 1342. At what time does the coach arrive?

7. Julie arrives at work at 0855 and leaves at 1622. For how long is she at work?

8. Alison arrives at her friend's house at 1732 and leaves at 1921. For how long is she at her friend's house?

1. Sam is paid £4 per hour and works 30 hours each week. How much does he earn in one week?
2. Annie works from 0930 to 1630 each Saturday. She is paid £4.20 per hour. How much does she earn each Saturday?
3. Katie works for 6 hours per day on 4 days each week. She is paid £4.30 per hour. How much does she earn:
 - (a) each day,
 - (b) each week?
4. Helen is paid £8 per hour. The following table shows the times she starts and finishes work during one week.

	<i>Start Time</i>	<i>Finish Time</i>
Monday	0900	1600
Tuesday	0915	1545
Wednesday	0845	1600
Thursday	0855	1610
Friday	0942	1527

- (a) How much does she earn each day?
 - (b) How much does she earn in total?
5. Bill is paid £6 per hour. One week he earns £252. For how many hours did he work that week?

1. The coordinates of the corners of a shape are listed below:

$$(2, 1), (6, 2), (7, 5), (3, 4)$$

- (a) Draw the shape.
(b) What is the name of the shape?

2. The coordinates of a triangle are listed below:

$$(-5, -2), (-5, 4), (3, 1)$$

- (a) Draw the triangle.
(b) What type of triangle have you drawn?

3. The coordinates of 3 corners of a square are listed below:

$$(-3, -3), (4, -3), (4, 4)$$

Draw the square and write down the coordinates of the other corner.

4. The coordinates of 3 corners of a rectangle are listed below:

$$(-3, -2), (-4, 1), (3, 0)$$

Draw the rectangle and write down the coordinates of the other corner.

5. Plot the following points in order, joining them as you plot them:

$$(-1, 7), (-5, 7), (-7, 4), (-3, 2), (1, 4), (-1, 7)$$

What is the name of the shape you have drawn?

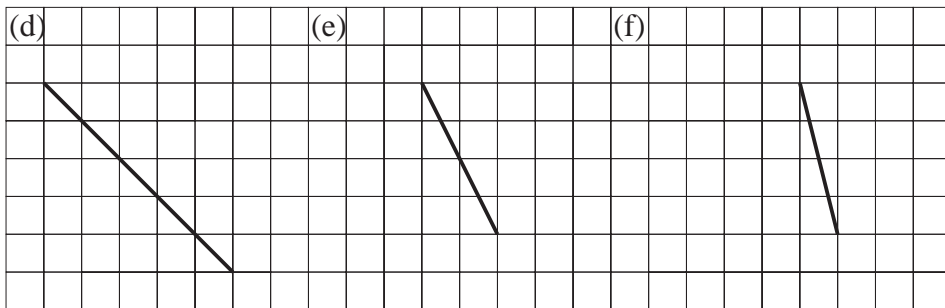
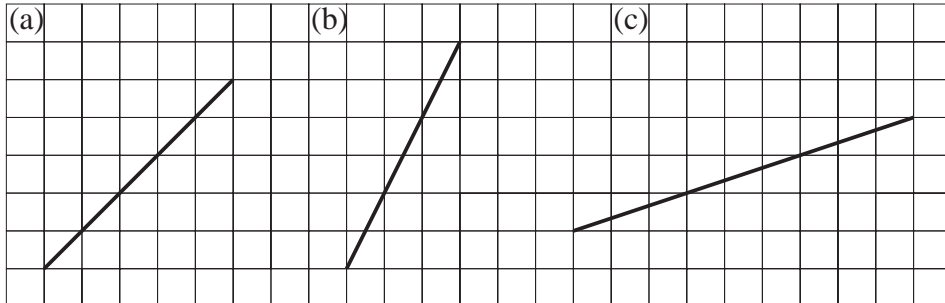
1. (a) Plot the points with coordinates:
 $(0, 7), (3, 4), (6, 1), (7, 0)$
(b) Draw a straight line through these points.
(c) What is the relationship between the x - and y -coordinates?

2. (a) Plot the points with coordinates:
 $(1, 2), (2, 4), (3, 6), (4, 8)$
(b) Draw a straight line through these points.
(c) What is the relationship between the x - and y -coordinates?

3. (a) Draw a straight line through the points with coordinates
 $(1, 0), (4, 3), (5, 4)$
(b) Write down the coordinates of 3 other points that lie on this line.
(c) What is the relationship between the x - and y -coordinates?

4. (a) Draw a straight line that passes through the points with coordinates
 $(1, 9), (6, 4), (7, 3)$.
(b) Write down the coordinates of 3 other points on this line.
(c) What is the relationship between the x - and y -coordinates?

1. Determine the gradient of each of the following lines:



2. (a) Copy and complete the following table for $y = x + 5$.

x	-3	-2	-1	0	1	2	3
y							

(b) Draw the line with equation $y = x + 5$.

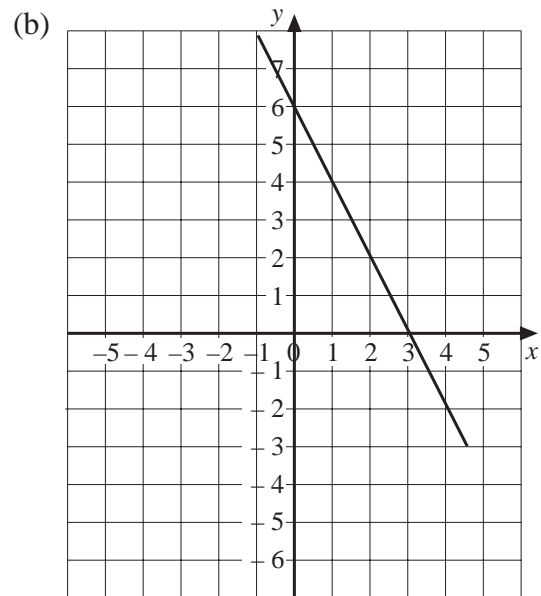
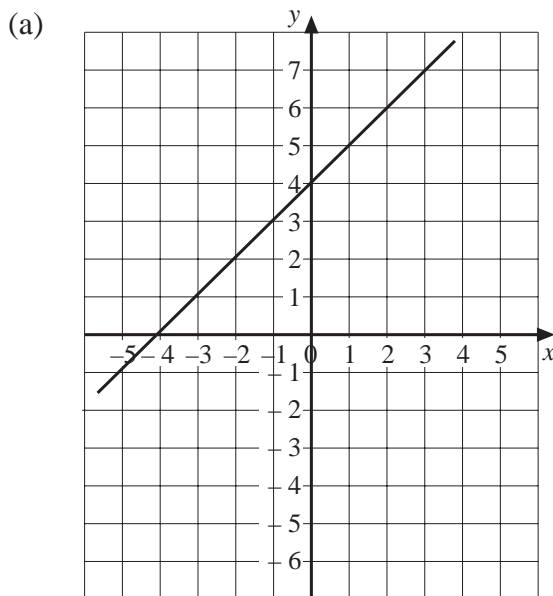
3. (a) Copy and complete the following table for $y = 3x - 4$.

x	-3	-2	-1	0	1	2	3
y							

(b) Draw the line with equation $y = 3x - 4$.

1. The points $(0, 1)$, $(3, 7)$ and $(4, 9)$ all lie on a straight line.
- Draw this straight line.
 - What is the *gradient* of this line?
 - What is the *intercept* of this line?
 - Write down the *equation* of this line.

2. Write down the equation of each of the lines shown below:



3. (a) Draw a line that passes through the points with coordinates below:
 $(1, 7)$, $(3, 5)$, $(5, 3)$
- What is the *gradient* of this line?
 - What is the *intercept* of this line?
 - Write down the *equation* of the line.

4. What is the *gradient* and the *intercept* of the lines with the following equations:

- | | |
|----------------------------|-------------------|
| (a) $y = 3x - 7$ | (b) $y = 7x + 2$ |
| (c) $y = \frac{1}{2}x + 1$ | (d) $y = -2x + 1$ |

1. Determine the equation of each of the straight lines that passes through the point with coordinates $(0, 0)$ and:
(a) $(2, 8)$ (b) $(4, 2)$ (c) $(2, 10)$

2. Determine the equation of each of the straight lines that pass through the two points:
(a) $(1, 1)$ and $(2, 3)$ (b) $(-2, 2)$ and $(3, 7)$
(c) $(0, 3)$ and $(6, 5)$ (d) $(1, 6)$ and $(4, 0)$
(e) $(0, 3)$ and $(3, -3)$ (f) $(0, -2)$ and $(4, -4)$