



# Answer Key

## Revision Sheet for Chapters 2, 7, 14, 8 and 5

### Objectives:

- To review the material covered in chapter 2, 7, 14, 8 and 5.

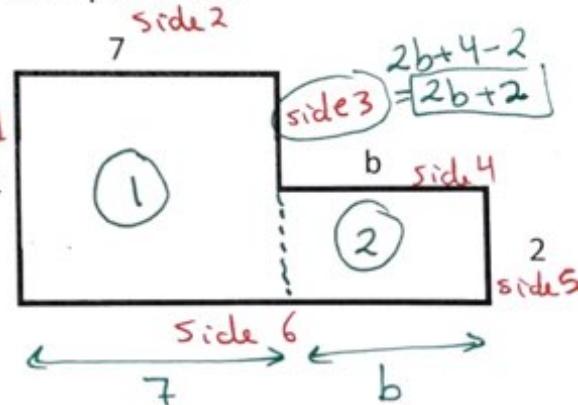
### Chapter 2: Expressions

1) Simplify:

$3a + 4b - 2a - 4b + 7$ <p>zero</p> $a + 7$	$5(a + 2b) - 3(2a + b)$ $5a + 10b - 6a - 3b$ $-a + 7b$	$4ab + 3a + 6b - 8ab$ $-4ab + 3a + 6b$
$15y^2 + 13y + 10y - 16y^2$ $-y^2 + 23y$	$2y^2z + 9yz + 2zy - 11zy^2$ $-9y^2z + 11yz$	$2x(2x - 4) + 5(3x^2 - 4x)$ $4x^2 - 8x + 15x^2 - 20x$ $19x^2 - 28x$

2) Write an expression for the perimeter and the area of the shape below.

$$\begin{aligned} \text{Perimeter} &= \text{side 1} + \text{side 2} + \text{side 3} + \text{side 4} + \text{side 5} + \text{side 6} \\ &= 2b + 4 + 7 + 2b + 2 + b + 2 + 7 + b \\ &= \boxed{6b + 22} \end{aligned}$$



$$\begin{aligned} \text{Area} &= \text{Area of 1} + \text{Area of 2} \\ &= 7(2b + 4) + 2b \\ &= 14b + 28 + 2b \\ &= \boxed{16b + 28} \end{aligned}$$

- 3) Write an expression for the change you receive from paying \$30 after purchasing 4 books costing "d" dollars *each*.

$$\boxed{30 - 4d}$$

- 4) Write using algebra: I think of a number "x", add 5 to it then halve it.

$$\frac{x+5}{2} \quad \underline{\text{or}} \quad \frac{1}{2}(x+5)$$

- 5) Factorize:

$6kg - 3lg + mg$ $g(6k - 3l + m)$	$10ab - 2ac + 5da$ $a(10b - 2c + 5d)$	$12y^2 + 8y$ $4y(3y + 2)$
$2\pi r^2 + 2\pi r$ $2\pi r(r + 1)$	$20x^4 + 10x^3 - 4x^2$ $2x^2(10x^2 + 5x - 2)$	$28axy + 7abx - 14xca$ $7ax(4y + b - 2c)$
$24k^2m^2n - 48k^2m^2n^2$ $24k^2m^2n(1 - 2n)$	$24p^4q^3 - 8p^3q - 10p^2q^2$ $2p^2q(12p^2q^2 - 4p - 5q)$	$4x^3y^2 - 8x^3y - 10x^3y^2$ $-6x^3y^2 - 8x^3y$ $-2x^3y(3y + 4)$  (Hint: simplify first)

6) If  $a = 4$ ,  $b = -3$ ,  $c = -2$  and  $d = 5$ , find the value of:

$-a - b - c - d$ $-4 - (-3) - (-2) - 5$ $-4 + 3 + 2 - 5$ $\underbrace{-1 + 2}_{1} - 5 = \boxed{-4}$	$2b - 3c + 3d$ $2(-3) - 3(-2) + 3(5)$ $-6 + 6 + 15$ $\underbrace{-6 + 6}_{\text{zero}} + 15 = \boxed{15}$	$3a(b - 2c)$ $3 \times 4(-3 - 2(-2))$ $12(-3 + 4)$ $12 \times 1 = \boxed{12}$
$\frac{abd}{c}$ $\frac{4 \times -3 \times 5}{-2}$ $= \frac{-60}{-2} = \boxed{30}$	$\frac{7b - 3c}{2d + 4}$ $\frac{7(-3) - 3(-2)}{2(5) + 4}$ $\frac{-21 + 6}{10 + 4} = \frac{-15}{14}$ $= \boxed{-1\frac{1}{14}}$	$4c^3 - d - 2b^2$ $4(-2)^3 - 5 - 2(-3)^2$ $4(-8) - 5 - 2(9)$ $-32 - 5 - 18$ $\underbrace{-37}_{-37} - 18 = \boxed{-55}$

## Chapter 7: Equations, formulae and inequalities

1) Solve.

$4t + 1.5 = 13.5$ $\begin{array}{r} -1.5 \quad -1.5 \\ \hline 4t = 12 \end{array} \Rightarrow \boxed{t = 3}$	$3a - 10 = -25$ $\begin{array}{r} +10 \quad +10 \\ \hline 3a = -15 \end{array} \Rightarrow \boxed{a = -5}$
$\frac{5x}{5} = \frac{65}{5}$ $\boxed{x = 13}$	$7 - 2x = 21$ $\begin{array}{r} +2x \quad +2x \\ \hline 7 = 21 + 2x \\ -21 \quad -21 \\ \hline -14 = 2x \end{array} \Rightarrow \boxed{x = -7}$
$\frac{x}{3} - 8 = 16$ $\begin{array}{r} +8 \quad +8 \\ \hline \frac{x}{3} = 24 \end{array}$ $3 \times \frac{x}{3} = 24 \times 3$ $\boxed{x = 72}$	$6 \times \frac{x}{6} = 4 \times 6$ $\boxed{x = 24}$
$8x - 15 = 5x - 6$ $\begin{array}{r} -5x \quad -5x \\ \hline 3x - 15 = -6 \\ +15 \quad +15 \\ \hline 3x = 9 \end{array} \Rightarrow \boxed{x = 3}$	$7(p + 2) = 5(p + 6)$ $7p + 14 = 5p + 30$ $\begin{array}{r} -5p \quad -5p \\ \hline 2p + 14 = 30 \\ -14 \quad -14 \\ \hline 2p = 16 \end{array} \Rightarrow \boxed{p = 8}$
<p><i>Expand Simplify solve</i></p> $4x + 2(x + 2) - x = 2x + 9$ $4x + 2x + 4 - x = 2x + 9$ $5x + 4 = 2x + 9$ $\begin{array}{r} -2x \quad -2x \\ \hline 3x + 4 = 9 \\ -4 \quad -4 \\ \hline 3x = 5 \end{array} \Rightarrow \boxed{x = 1 \frac{2}{3}}$	$9(2x - 4) + 20 = 10x + 8$ $18x - 36 + 20 = 10x + 8$ $18x - 16 = 10x + 8$ $\begin{array}{r} -10x \quad -10x \\ \hline 8x - 16 = 8 \\ +16 \quad +16 \\ \hline 8x = 24 \end{array} \Rightarrow \boxed{x = 3}$
$3 \times \frac{x + 2}{3} = -4 \times 3$ $\begin{array}{r} x + 2 = -12 \\ -2 \quad -2 \\ \hline x = -14 \end{array}$ $\boxed{x = -14}$	$\frac{x - 5}{2} + 7 = 10$ $2 \times \frac{x - 5}{2} = 3 \times 2$ $\begin{array}{r} x - 5 = 6 \\ +5 \quad +5 \\ \hline x = 11 \end{array} \Rightarrow \boxed{x = 11}$

2) For the below questions, **first** write an equation, **then** solve it.

(i) The sum of two consecutive whole numbers is 45. What are the numbers?

<u>number 1</u>		<u>number 2</u>
$x$		$x+1$

$$\begin{aligned} x + x + 1 &= 45 \\ 2x + 1 &= 45 \end{aligned} \Rightarrow \frac{2x}{2} = \frac{44}{2} \Rightarrow x = 22$$

Answer  $\Rightarrow$  22 and 23

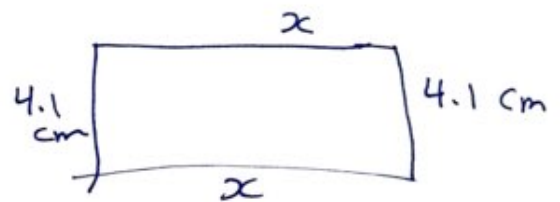
(ii) Find the length of a rectangle, if the width is 4.1 cm and the perimeter is 22.4 cm.

$$x + x + 4.1 + 4.1 = 22.4$$

$$\begin{aligned} 2x + 8.2 &= 22.4 \\ - 8.2 &\quad - 8.2 \end{aligned}$$

$$\frac{2x}{2} = \frac{14.2}{2}$$

$x = 7.1 \text{ cm}$



(iii) Tia is 4 years younger than her brother Omar. The sum of their ages is 34. What are their ages?

$$x + x - 4 = 34$$

$$\begin{aligned} 2x - 4 &= 34 \\ + 4 &\quad + 4 \end{aligned}$$

$$\frac{2x}{2} = \frac{38}{2}$$

$$x = 19$$

<u>Tia</u>		<u>Omar</u>
$x-4$		$x$

Omar is 19  
and Tia is 15

(iv) The perimeter of the equilateral triangle below is 63. What is the length of each side?

equal sides !

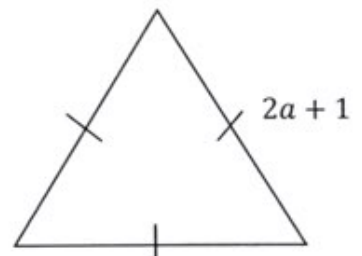
$$(2a+1) + (2a+1) + (2a+1) = 63$$

$$\begin{aligned} 6a + 3 &= 63 \\ - 3 &\quad - 3 \end{aligned}$$

$$\frac{6a}{6} = \frac{60}{6}$$

$$a = 10$$

Therefore, the sides are  $2 \times 10 + 1$  each  $\Rightarrow 20 + 1 = \boxed{21}$



3) Using  $s = ut + \frac{1}{2}at^2$ , find "u" if  $s = 27$ ,  $t = -3$ ,  $a = 2$ .

$$27 = -3u + \frac{1}{2} \times 2 \times (-3)^2$$

$$27 = -3u + 9$$

$$\frac{18}{-3} = \frac{-3u}{-3} \Rightarrow \boxed{u = -6}$$

4) Use the formula  $m = \frac{5K}{8}$  to convert 32 km into miles.

$$m = \frac{5 \times 32}{8}$$

$$m = 5 \times 4$$

$$= \boxed{20 \text{ miles}}$$

5) Rearrange the formula to make the letter in brackets the subject.

$x - 4 = y \quad (x)$ $+4 \quad +4$ $\boxed{x = y + 4}$	$g = 2m + c \quad (m)$ $-c \quad -c$ $\frac{g - c}{2} = \frac{2m}{2}$ $\boxed{\frac{g - c}{2} = m}$	$\frac{c}{5} = \frac{5(a + b)}{5} \quad (b)$ $\frac{c}{5} - a = \frac{5}{5}a + b$ $\boxed{\frac{c}{5} - a = b}$
$e \times \frac{abd}{e} = c \times e \quad (d)$ $\frac{abd}{ab} = \frac{ce}{ab}$ $\boxed{d = \frac{ce}{ab}}$	$T = 4e - 5f \quad (e)$ $+5f \quad +5f$ $\frac{T + 5f}{4} = \frac{4e}{4}$ $\boxed{\frac{T + 5f}{4} = e}$	$s = \frac{4}{5}m - 9 \quad (m)$ $+9 \quad +9$ $5 \times (s + 9) = \frac{4}{5}m \times 5$ $\frac{5(s + 9)}{4} = \frac{4m}{4}$ $\boxed{\frac{5(s + 9)}{4} = m}$

6) Draw a function machine to show how to find "v" starting with "t", using the formula  $v = u + at$ .

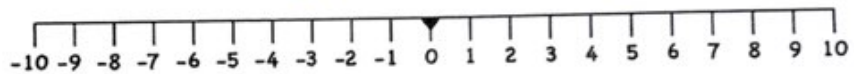
$$t \rightarrow \times a \rightarrow + u \rightarrow v$$

7) Represent these inequalities on a number line.

a.  $x > 7$



b.  $-3 \leq x < 5$



c. What is the largest integer that "x" could be in the inequality  $x < 10$ .

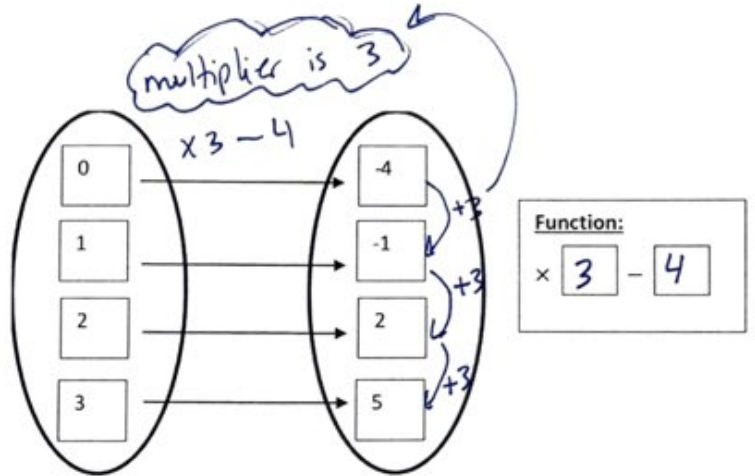
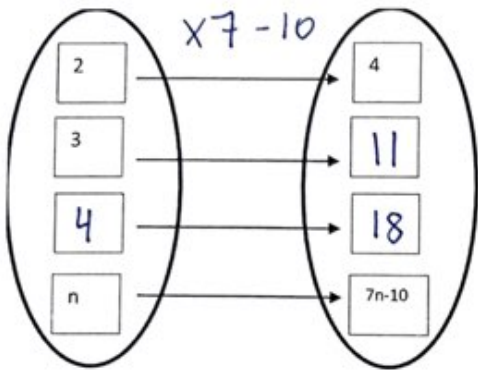
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d. Write down all the integers that satisfy the inequality  $-2 < x \leq 9$

-1, 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.

# Chapter 14: Function and graphs

1) Complete the mapping diagrams:



2) For the graph below, do the following:

a. List the set of coordinates shown.

- $(-2, -7)$      $(0, -3)$      $(2, 1)$   
 $(-1, -5)$      $(1, -1)$

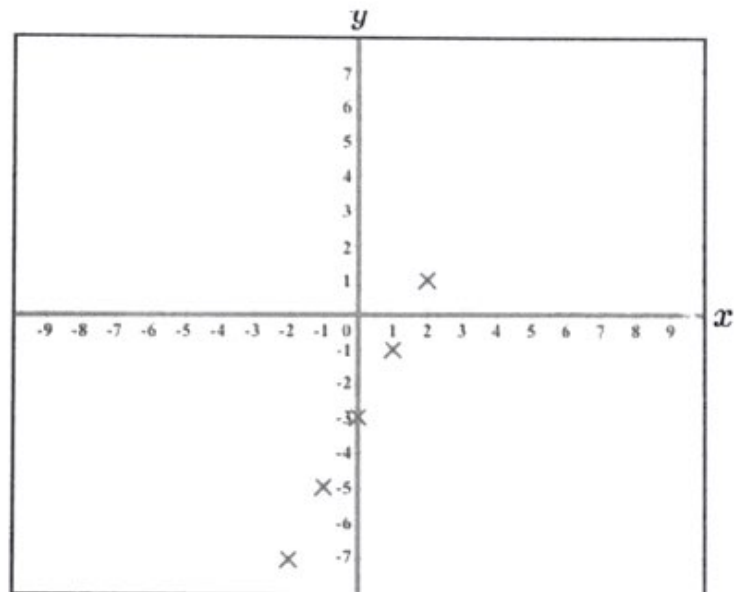
$x$      $y$   
 $(-2, -7)$   
 $(-1, -5)$  +2 therefore multiplier is  
 $(0, -3)$  2  
 $(1, -1)$   
 $(2, 1)$

b. What rule has been used for the mapping?

$x \cdot 2 - 3$

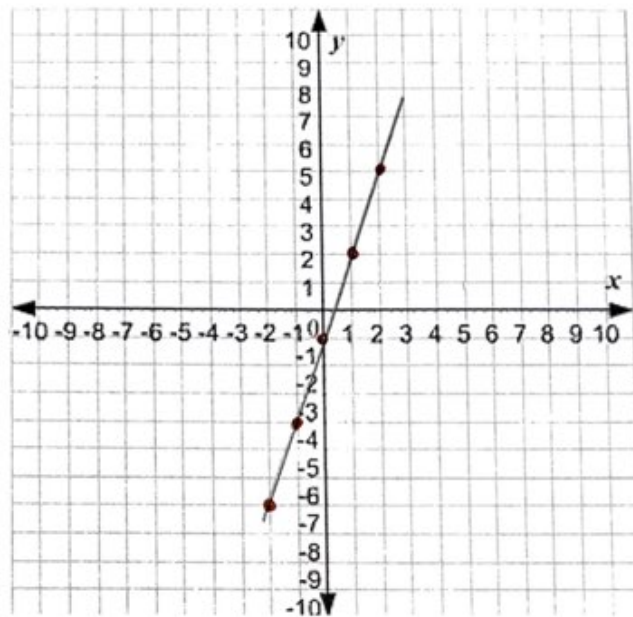
c. Draw a function machine that will produce this mapping.

$x \rightarrow x \cdot 2 \rightarrow -3 \rightarrow y$





- 3) For the inputs  $-2, -1, 0, 1, 2$ , draw a graph of the mapping of the  $x$ -coordinate to the  $y$ -coordinate using:  $x \rightarrow 3x - 1$ . Join the five points with a straight line.



$x$	$y$
$-2 \times 3 - 1$	$-7$
$-1 \times 3 - 1$	$-4$
$0 \times 3 - 1$	$-1$
$1 \times 3 - 1$	$2$
$2 \times 3 - 1$	$5$

- 4) For the equations below, write down the value of:

a) the gradient,  $m$

b) the Y-intercept,  $c$

i.  $y = 3x - 4$  ( $m = 3$ ,  $c = -4$ )

ii.  $y = 7 - 2x$  ( $m = -2$ ,  $c = 7$ )

iii.  $y = -x - 1$  ( $m = -1$ ,  $c = -1$ )

iv.  $y = 2x$  ( $m = 2$ ,  $c = 0$ )

v.  $y = \frac{3}{4}x - 9$  ( $m = \frac{3}{4}$ ,  $c = -9$ )

5) Sort these lines into two groups shown in the table:

$$y = 4x - 5$$

$$y = 7 - x$$

$$y = -2x + 3$$

$$y = \frac{2}{3}x + 1$$

$$y = -1 + 7x$$

Line sloping upwards	Line sloping downwards
$y = 4x - 5$	$y = 7 - x$
$y = \frac{2}{3}x + 1$	$y = -2x + 3$
$y = -1 + 7x$	

6) Which of these points lie on the line  $y = 5 - 4x$ , show your work:

$$(1, 1)$$

$$(-2, 13)$$

$$(0, 4)$$

$$(3, -7)$$

$$(4, 21)$$

$$(-3, 17)$$

$$\begin{aligned} &\downarrow \\ y &= 5 - 4(1) \\ &= 5 - 4 \\ &= 1 \end{aligned}$$

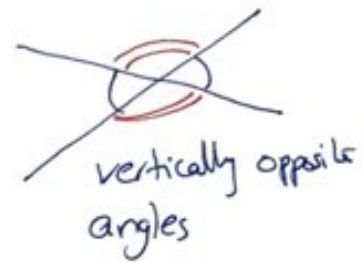
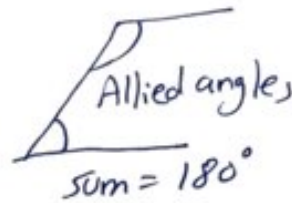
$$\begin{aligned} y &= 5 - 4(-2) \\ &= 5 + 8 \\ &= 13 \end{aligned}$$

$$\begin{aligned} y &= 5 - 4(0) \\ &= 5 - 0 \\ &= 5 \end{aligned}$$

$$\begin{aligned} y &= 5 - 4(3) \\ &= 5 - 12 \\ &= -7 \end{aligned}$$

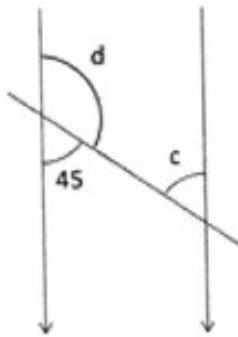
$$\begin{aligned} y &= 5 - 4(4) \\ &= 5 - 16 \\ &= -11 \end{aligned}$$

$$\begin{aligned} y &= 5 - 4(-3) \\ &= 5 + 12 \\ &= 17 \end{aligned}$$



## Chapter 8: Geometry

1) Find the missing angles, show all your work and give reasons for your answers.

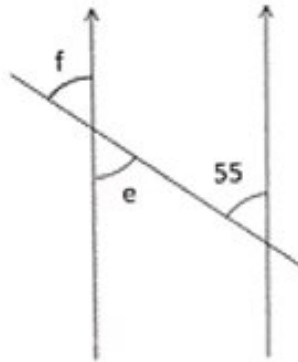


$c = 45^\circ$

Reason: Alternate angles

$d = 180^\circ - 45^\circ = 135^\circ$

Reason: Allied with angle (c)  
or supplementary on a straight line with angle (d)

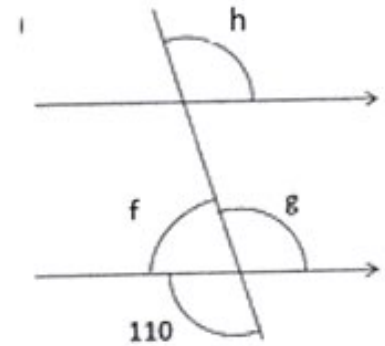


$e = 55^\circ$

Reason: Alternate angles

$f = e = 55^\circ$

Reason: vertically opposite angles.



$f = 180^\circ - 110^\circ = 70^\circ$

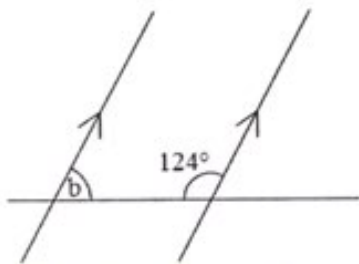
Reason: supplementary angles on a straight line

$g = 110^\circ$

Reason: vertically opposite angles

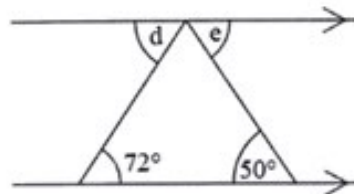
$h = g = 110^\circ$

Reason: Corresponding angle



$b = 180^\circ - 124^\circ = 56^\circ$

Reason: Allied angles

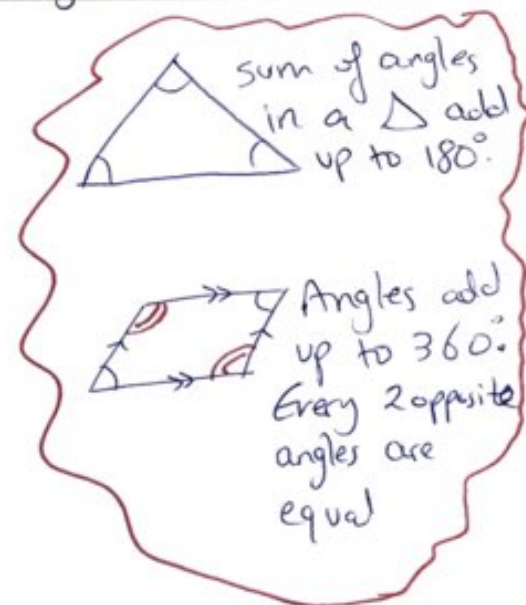


$d = 72^\circ$

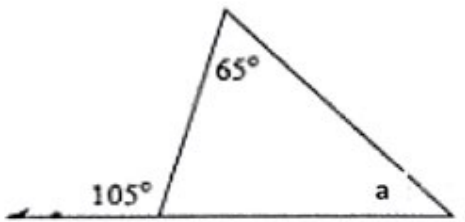
Reason: Alternate angles

$e = 50^\circ$

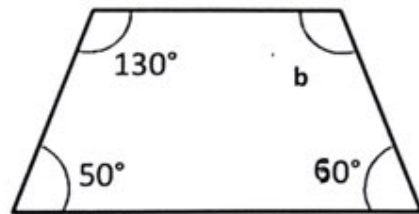
Reason: Alternate angles



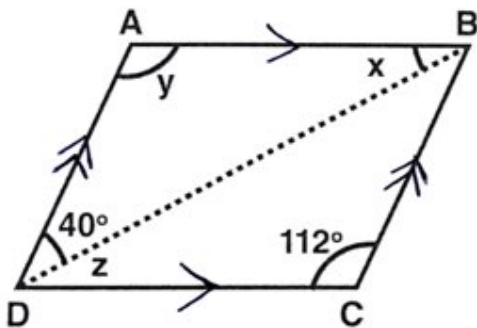
2) For the shapes below, find the missing angles, show all your work.



$$a = 105^\circ - 65^\circ = 40^\circ$$



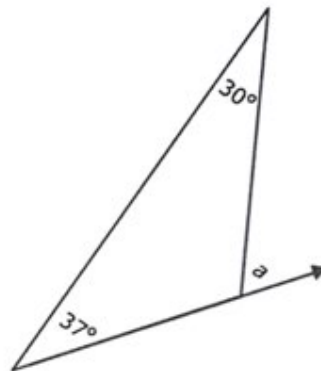
$$b = 360^\circ - (130^\circ + 50^\circ + 60^\circ) = 120^\circ$$



$$x = 180^\circ - (112^\circ + 40^\circ) = 28^\circ$$

$$y = 112^\circ$$

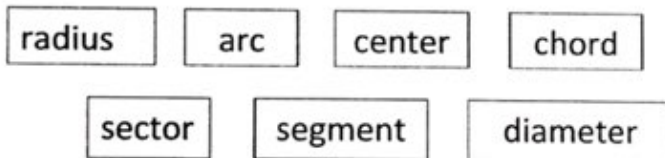
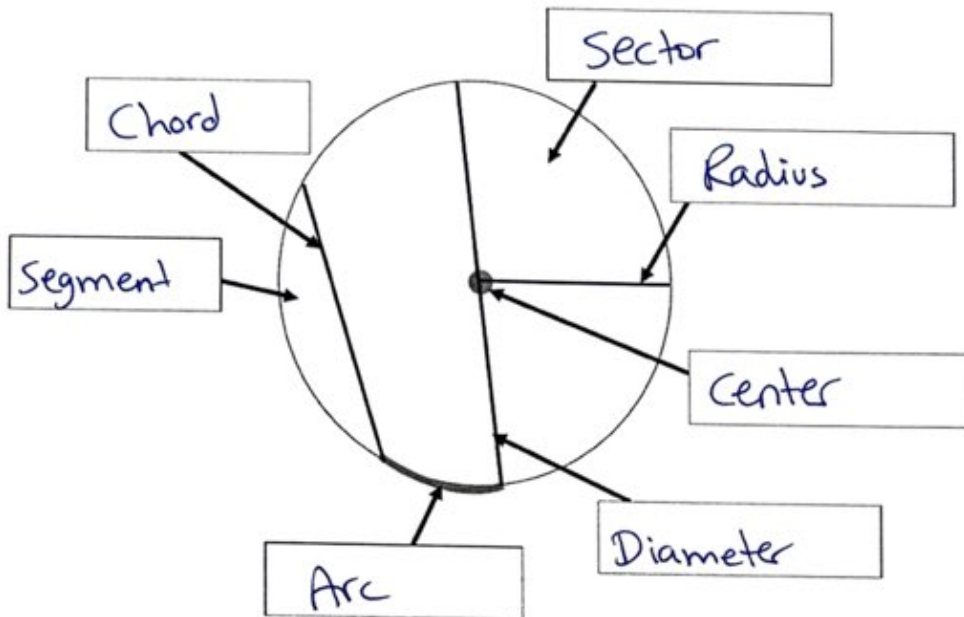
$$z = x = 28^\circ$$



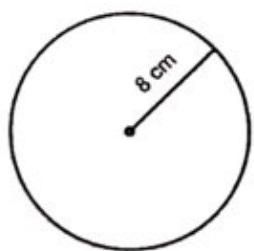
$$a = 30^\circ + 37^\circ = 67^\circ$$

## Chapter 5: Area, perimeter and volume

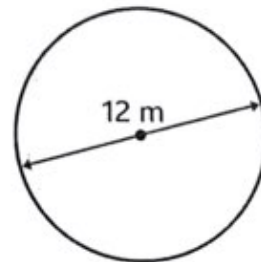
1) Fill in the empty boxes:



2) Find the circumference of the circles below:

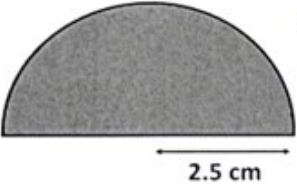
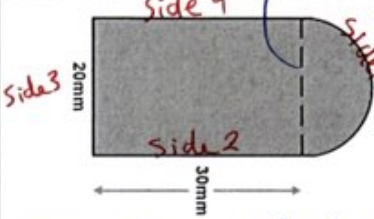


$$\begin{aligned}d &= 8 \times 2 \\ &= 16 \text{ cm} \\ C &= \pi \times d \\ &= 3.14 \times 16 \\ &= 50.24 \text{ cm}\end{aligned}$$

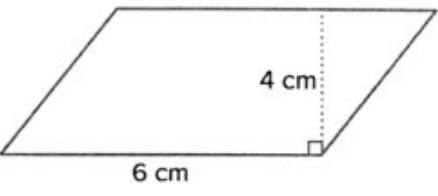
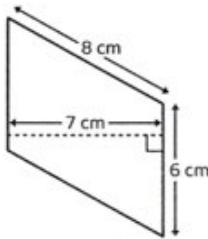


$$\begin{aligned}C &= \pi \times d \\ &= 3.14 \times 12 \\ &= 37.68 \text{ m}\end{aligned}$$

3) Find the perimeter of the shapes below:

 <p> <math>d = 2.5 \times 2</math>  <math>= 5 \text{ cm}</math>  <math>C = \pi \times 5</math>  <math>= 15.7 \text{ cm}</math>                      for half a circle <math>= C \div 2</math>  <math>= 15.7 \div 2</math>  <math>= 7.85 \text{ cm}</math>                      Perimeter <math>= 7.85 + 5 = \boxed{12.85 \text{ cm}}</math> </p>	 <p> <math>d = 20 \text{ mm}</math>  <math>C = \pi \times 20</math>  <math>= 62.8 \text{ mm}</math>  <math>\frac{1}{2} \text{ a circle} = 62.8 \div 2</math>  <math>= \boxed{31.4 \text{ mm}}</math> (side 1)                 </p> <p> <math>P = \text{side 1} + \text{side 2} + \text{side 3} + \text{side 4}</math>  <math>= 31.4 + 30 + 20 + 30</math>  <math>= 111.4 \text{ mm}</math> </p>
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4) Find the area of the parallelograms below:

 <p> <math>A = b \times h</math>  <math>= 4 \times 6 = 24 \text{ cm}^2</math> </p>	 <p> <math>A = b \times h</math>  <math>= 6 \times 7</math>  <math>= 42 \text{ cm}^2</math> </p>
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5) Complete the table for **Parallelograms**:

	Base (m)	Height (m)	Area (m <sup>2</sup> )
1	3.2	$h = 25.6 \div 3.2$ $= 8$	25.6
2	$b = 191.7 \div 9$ $= 21.3$	9	191.7