

Year 9 Term 3 Homework

Student Name: _____	Grade: _____
Date: _____	Score: _____

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9 Year 9 Term 3 Week 9 Homework

9.1 The Linear Function

9.1.1 Graphing straight lines

There are 4 different ways of expressing a relationship between the two variables x and y .

1. Algebraic: This is written as an equation eg. $y = 2x + 4$
2. Table Form: A table consisting of at least three x values is written down. A table of values for $y = 2x + 4$:

x	0	1	2
y	4	6	8

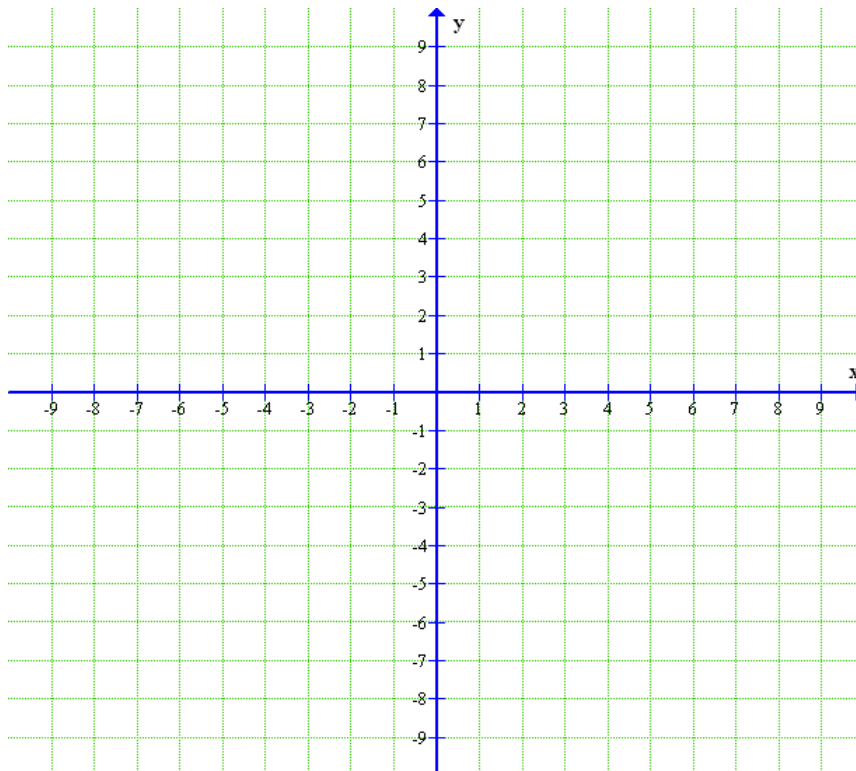
3. Ordered Pairs: From the table above the ordered pairs are $(0, 4)$ $(1, 6)$ $(2, 8)$.
4. Graph: Both the values of the table and 3 ordered pairs can be used to plot the straight line on the number plane.

Exercise 9.1.1 Graph the following lines on the same number plane.

(a) $y = 2x + 1$,

(b) $y = 3 - x$,

(c) $y = 4x - 5$

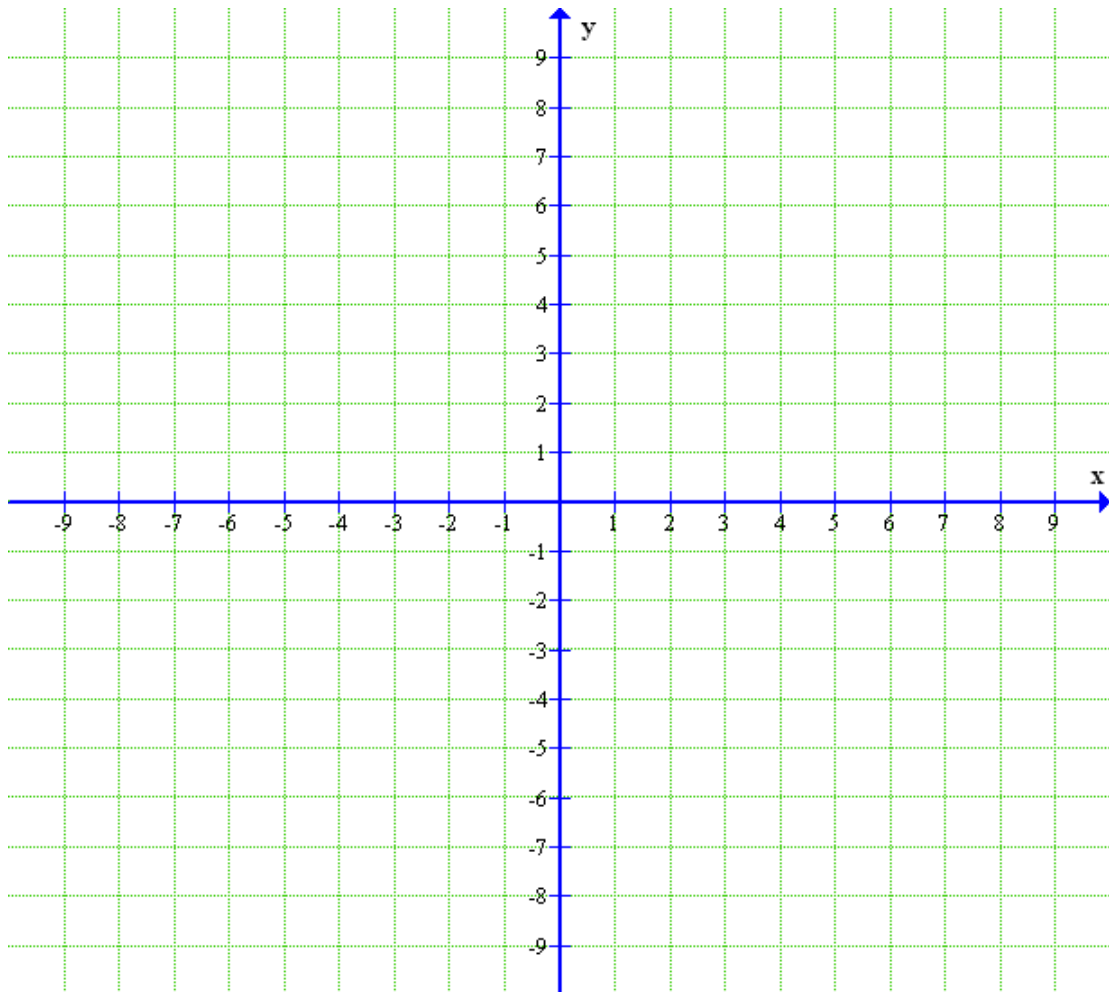


Exercise 9.1.2 Graph each of these lines on the same number plane.

1. $y = 2 - 2x$

2. $2x + y = 6$

3. $3x - y = 3$

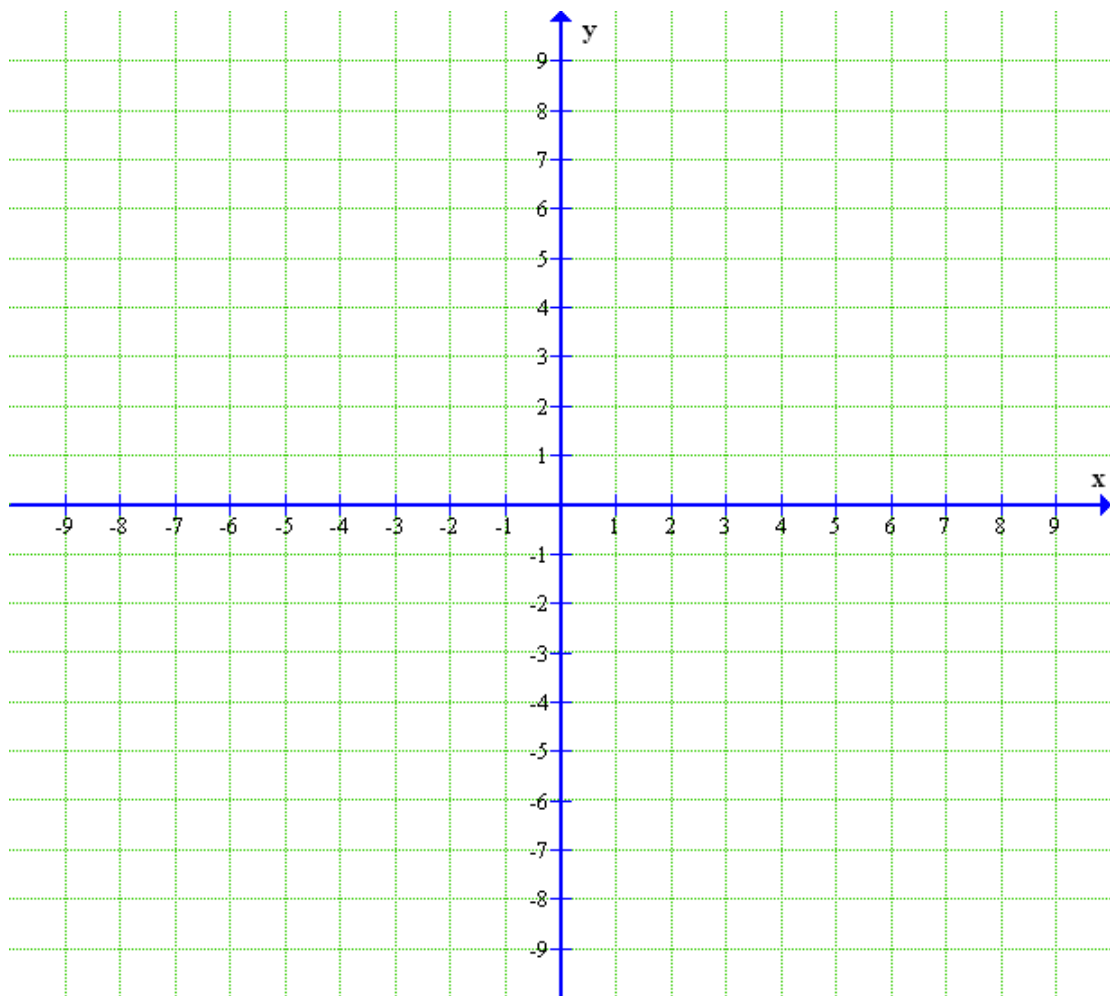


Exercise 9.1.3 Find the x-intercept and y-intercept and hence sketch each of the following lines.

1. $x - 2y = 8$

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

3. $y = -2x - 5$



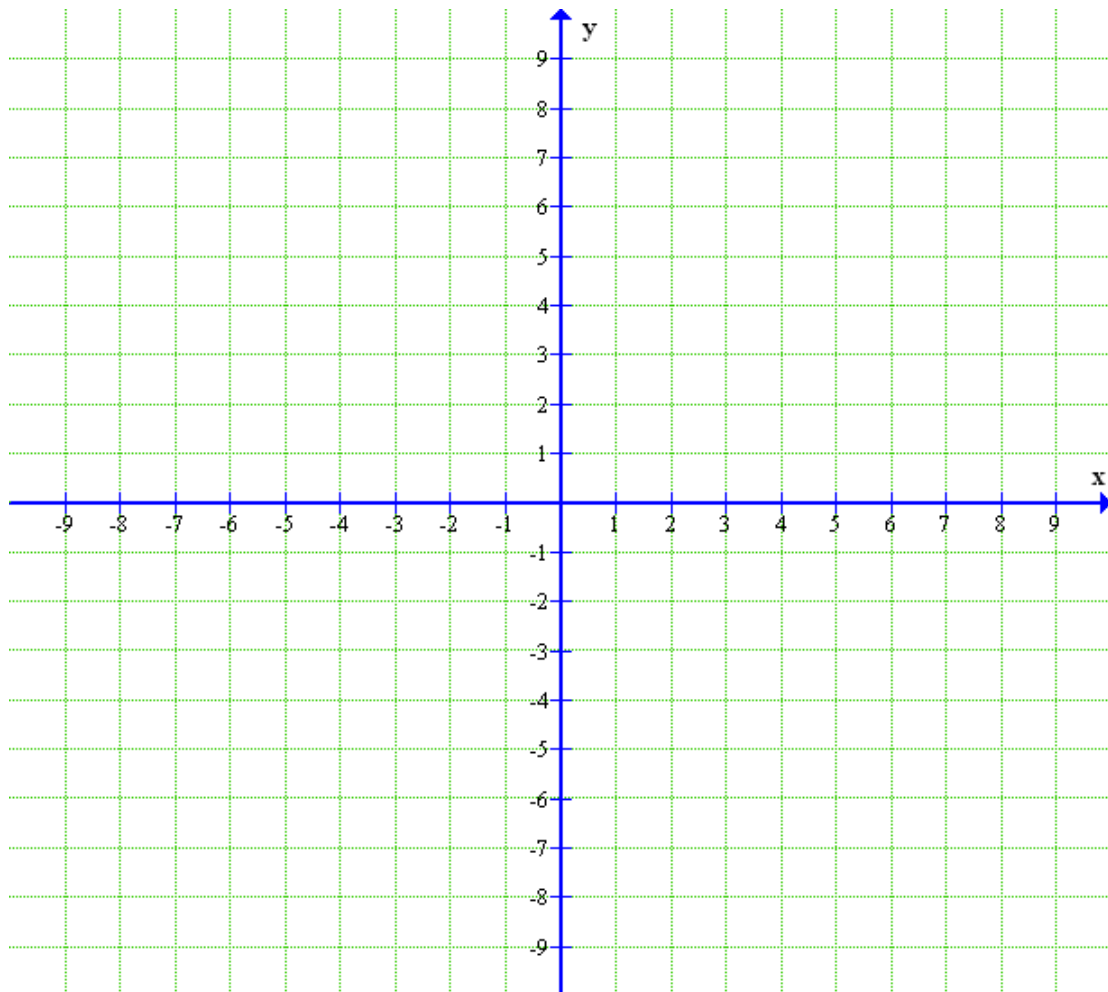
9.1.2 Special line graphs

There are two types of special line graphs:

1. A vertical line function: $x = 6$
2. A horizontal line function $y = 4$.

Exercise 9.1.4 Graph the following lines:

1. $x = 6$
2. $y = x$
3. $y = -x$
4. $y = 4$



9.2 Trigonometry

9.2.1 Trigonometric ratios using a calculator

Exercise 9.2.1 Evaluate, correct to the nearest hundredth:

1. $\frac{12\sin 56^\circ}{5\cos 23^\circ}$

2. $\frac{\sin 57^\circ + \tan 12^\circ}{\cos 18^\circ}$

3. $\frac{\tan 65^\circ}{\cos 72^\circ - \sin 10^\circ}$

4. $\frac{\tan 52^\circ - \sin 26^\circ}{\sin 36^\circ + \cos 16^\circ}$

5. $\frac{\sin 45^\circ + \cos 72^\circ}{\tan 28^\circ \tan 46^\circ}$

Exercise 9.2.2 Find the angle θ , correct to the nearest degree.

1. $\cos \theta = \frac{2}{13}$

2. $\tan \theta = \frac{6}{17}$

3. $\sin \theta = \frac{4}{11}$

4. $\tan \theta = \frac{12}{5}$

5. $\cos \theta = \frac{3}{7}$

Exercise 9.2.3 Draw a diagram and mark on it all of the given information to answer each of the following:

1. In $\triangle XYZ$, $\angle Y = 90^\circ$, $\angle Z = 39^\circ$ and $XZ = 18$ cm. Find the length of YZ , correct to 2 decimal places.

2. In $\triangle PQR$, $\angle R = 90^\circ$, $\angle Q = 45^\circ$ and $PQ = 27$ cm. Find the length of PR , correct to 2 decimal places.

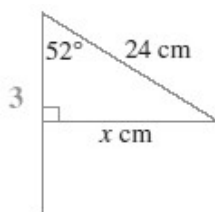
3. In $\triangle TUV$, $\angle V = 90^\circ$, $\angle T = 75^\circ$ and $TV = 51$ cm. Find the length UV , correct to 2 decimal places.

4. In $\triangle LMN$, $\angle M = 90^\circ$, $\angle L = 16^\circ$ and $LM = 34$ km. Find the length of LN , correct to nearest metre.

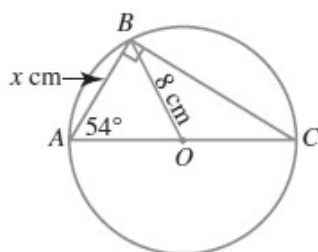
9.2.2 Problem solving

Exercise 9.2.4

1. The diagonal edge of a sport club pennant makes an angle of 52° with the stick to which it is attached. Find the horizontal length of the pennant, given that the diagonal edge is 24 cm. Answer correct to 1 decimal place.



2. In the diagram, AC is a diameter of the circle and O is the centre. If $OB = 8$ cm, $\angle A = 54^\circ$ and $\angle ABC = 90^\circ$, find:



- (a) the length of the diameter AC .

- (b) the lengths of the chord AB and BC , correct to 1 decimal place.

Exercise 9.2.5 Further applications

1. In a certain time of day when the altitude of the sun is 38° , a tree casts a shadow of 22.5 m on the ground. Find the height of the tree, correct to the nearest metre.

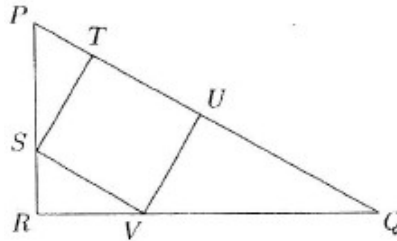
2. A surveyor walked 45 m from A to B along a river bank, then measured the angle to a point C, which lies on the opposite side of the river and is directly in line with the point A. Calculate the width of the river, correct to nearest metre, given that $\angle ABC = 45^\circ$.

3. At a local shopping centre, a wheelchair ramp is inclined to the horizontal at an angle of 14° . Find the length of the ramp if it leads to an entrance that is 2.1 m higher than the surrounding floor area. Answer correct to the nearest tenth of a metre.

9.3 Maths Challenge

Exercise 9.3.1

1. PQR is a right-angled triangle with $PR = 6$ cm and $RQ = 8$ cm. The square $STUV$ is inscribed in $\triangle PQR$. Find the area of the square.

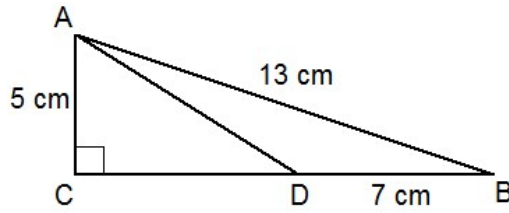


2. The notation $\lfloor x \rfloor$ means the largest integer not greater than x . For example $\lfloor 3.5 \rfloor = 3$ and $\lfloor 5 \rfloor = 5$. Find the number of positive integers x for which $\lfloor x^{\frac{1}{2}} \rfloor + \lfloor x^{\frac{1}{3}} \rfloor = 10$.

3. For each of the three-digit numbers with no digits zero, the difference between the number itself and the product of its digits is calculated. What is the largest such difference?

9.4 Miscellaneous Exercise

Exercise 9.4.1 In the diagram shown below, $BD = 7\text{ cm}$, $AB = 13\text{ cm}$, $AC = 5\text{ cm}$ and $\angle ACB = 90^\circ$. Find:



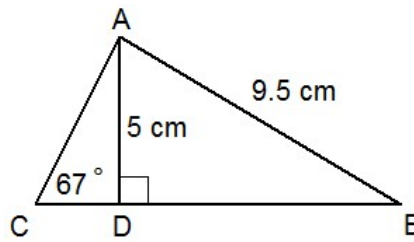
1. the length of CD

2. the size of $\angle ADC$

3. the size of $\angle BAD$

4. $\sin \angle ABC + \cos \angle BAC$.

Exercise 9.4.2 In the figure, $AD = 5\text{ cm}$, $AB = 9.5\text{ cm}$, $\angle ACB = 67^\circ$ and $\angle ADB = 90^\circ$. Find:



1. the size of $\angle BAD$ correct to nearest minute.

2. the length of AC and BC , correct to 2 decimal places.

Exercise 9.4.3 A ladder resting against a wall makes an angle of 60° with the group. When the base of the ladder is moved 1 metre further from the wall it makes an angle of 45° with group. Find the length of the ladder, leave your answer in surd form.

