

Vocabulary

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Like any specialist subject mathematics has its own language. The most important elements of that language (and not only for mathematicians) is the set of numbers. Next come all the words and phrases which have been well-defined for use within mathematics and, linked with those are the many symbols which are used so much by mathematicians.

The exercises here are concerned with the formation of words, especially those which contain numbers implicitly, and are used in our everyday language as well as in mathematics.

Much of the work could be done without any other support, but it would be much better done with the aid of a good dictionary. And there are just a few cases where access to a dictionary of the size more often found in a library would be beneficial.

Vocabulary Exercises ~ Origins

Many of the words we use today in the English language originated from the Greek or Latin languages. The table below shows the connections between these three languages by giving the equivalent meanings of some of the words used in mathematics.

English	Greek	Latin	English	Greek	Latin
number	arithmos	numero	first	protos	primo
one	hen	unus	second	deuteros	secundo
two	di	bi	third	tritros	tertio
three	tria	tres	single	monos	singuli
four	tetra	quattuor	treble	triploos	triplico
five	penta	quinque	half	hemi	semi
six	hex	sex	angle	gonia	angulo
seven	hepta	septem	base	basis	base
eight	octo	octo	centre	centro	centro
nine	ennea	novem/nones	circle	cyclos	circulo
ten	deca	decem	cube	cubos	cubo
twelve	dodeca	duodecim	curve	campyle	sinu
hundred	hecaton	centum	cylinder	cylindros	cylindro
thousand	kilo	mille	ring	gyros	annulo
many	poly	poli	spiral	helix	spira

Exercises

1. What we now generally refer to as 'quadrilaterals' the Greeks called 'tetragons'. Explain why
2. When we describe a hexagon we usually say it has 6 edges (or sides). However, this not the *exact* meaning of the word in Greek. How would the Greeks have described it?
3. What name do we now use for what the Greeks would have referred to as a 'trigon'?
Then, bearing in mind that 'metre' means 'to measure', explain the exact meaning of 'trigonometry'.
4. Explain the origin (and original meaning) of 'geometry'.
5. From the table above we can see that September, October, November and December ought to be the 7th, 8th, 9th and 10th months respectively. But they are not!
Find out why this is so.
6. A polygon having 9 edges (or sides) is nowadays usually referred to as a 'nonagon'. However, it was not always called that, and many language experts argue that 'nonagon' is not the proper word (they describe it as a hybrid word). Study the names of other polygons and decide why it is that the word 'nonagon' bothers the experts
7. The following are used as prefixes - that is they start a word.

kilo-	heca- or hecto-	mono
cent-	sex-	semi-

For *each* of these prefixes, find four words in English that use them. Two of the words must be mathematical, and two of them generally used outside of mathematics. Give the meaning of each showing the part played by the prefix.

Vocabulary Exercises ~ 'two'-words

The prefix 'bi' comes to us from Latin and means 'two', but we always need to be clear how the 'two' is being used. For example:

'biannual' means happening twice in one year

'biennial' means happening once in two years.

We must also not assume that every word starting with 'bi' has something to do with 'two'. For example:

bias	bib	bible
bide	big	bin

have nothing whatever to do with 'two' in their meanings, and there are many others like that.

Exercise 1

List ten words (other than those above) which start with 'bi' and which have nothing to do with 'two'. Proper names (such as 'Bill' and 'Bilbao') must not be used.

There are over fifty words in the English language which use the prefix 'bi' and do have something to do with 'two', though some of them are rarely used. Here are ten of them:

biplane	binocular	bigamy	bicycle
bivalve	biped	bicentenary	bifocal
bilingual	biceps		

Exercise 2

List the above ten 'bi' words in alphabetical order.

Opposite each of them write a word from this list which could be associated with it. No word in this list must be used twice.

celebration	translator	animal	aircraft
spectacles	arm	travel	shell
marriage	observer		

Give the meanings of any five of the 'bi' words from the above list. Remember to use the word 'two' in your definitions.

Here is another list of ten 'bi' words that are used in mathematics and which have something to do with 'two':

*billion	*bisect	biangular	bilinear
*binary	*bimodal	bicimal	bivariate
*binomial			biquadrate

Exercise 3

Write out the meanings of the five words in the above list marked with an asterisk*.

Exercise 4

Find another five 'bi' words, other than any given here, which have something to do with 'two', and explain their meanings.

Vocabulary Exercises ~ 'three'-words

The prefix 'tri' to mean 'three' has come to us from both the Greek and Latin languages. However, there are many words in the English language starting with 'tri' which have nothing to do with 'three'. For example:

trial tribe trifle trip trivial

Exercise 1

List five words (other than those above) which start with 'tri' and which have nothing to do with 'three'. Proper names (such as 'Trinidad' and 'Tristan') must not be used.

There are many words in the English language which use the prefix 'tri' and do have something to do with 'three', though some of them are rarely used. Here are ten:

tripod tricycle trimaran tripartite
trilogy tricolour triennial trident
trio triplet

Exercise 2

List the above ten 'tri' words in alphabetical order.

Opposite each of them write a word from this list which could be associated with it. No word in this list must be used twice.

flag weapon baby books
stool divided travel boat
anniversary music

Give the meanings of any five of the 'tri' words from the above list. Remember to use the word 'three' in your definitions.

Here is another list of ten 'tri' words that are used in mathematics and which have something to do with 'three':

triangle trisect trillion triple
trigonometry trinomial trihedral trichotomy
trilinear trihexaflexagon

Exercise 3

Write out the meanings of the four words on the top line of the above list.

Sometimes we can see how the prefix has been changed merely to get the correct number in the word. For example:

duplicate - triplicate

can be paired to show this. Of course, it cannot always be done - we can have a triangle but not a biangle!

Exercise 4

Give five examples of number-change pairs like those above. One word in each pair must be a 'tri' word.

Exercise 5

Make up a 'definition' (or story) about one word from your list in Exercise 1, showing that it 'does' have something to do with 'three'.

Vocabulary Exercises ~ other number-words

Whilst 'bi' and 'tri' are the most commonly used number-prefixes in the English language, there are several others. For example:

mono-	duo-	di-	tetra-
quad-	quart-	pent-	quin-
hex-	sex-	oct-	dec-

In each of the following exercises, do not give single word answers, but give sufficient explanation so that it is clear what the number is, and its effect.

1. Explain what a 'monopoly' is.
2. When two babies are born at the same birth, they are described as 'twins'. List the words used for all other multiple births up to seven.
3. How many events should there be in each of these:
Biathlon Pentathlon Decathlon
List the events in each.
4. What is the difference between a 'tetragram' and a 'telegram'?
5. When is 'Quadragesima Sunday'?
6. How many faces does a 'tetrahexahedron' have?
7. If you were shown a painting and told it was an example of Italian art in the 'Quattrocento', in what century would it have been painted?
8. Where would you find *The Pentateuch*?
9. What is the difference between a 'pentagon' and a 'quincunx'?
10. On what can you find an example of a 'quincunx'?
11. In a poem called *Cargoes* by John Masefield he refers to
'Quinquereme of Nineveh from distant Ophir'
What was a 'quinquereme'?
12. Are all insects also 'hexapods'?
13. Give the common name for a 'regular hexahedron'.
14. Where do we use the 'sexagesimal system'
(a) in mathematics (b) in our ordinary lives?
15. UK and USA usage agree on the size of a million (and the billion is just about standardized now) but not on the other '-illions'.
How much bigger is the 'sextillion' in the UK than the USA.?
16. Why is a collection of short stories by Boccaccio entitled
The Decameron?
17. What is our more usual name for *The Decalogue*?
18. Why is the instrument used by a navigator to fix a position on the surface of the Earth (or in space) called a 'sextant'?
19. Would you describe most ordinary Western civilizations as being basically 'monogamous' or 'polygamous'?
20. What is meant by the saying that:
'English law is the quintessence of reason'?