



Working out pay and overtime calculations

This task has three parts to it.

Part 1

In this part, you will find information and activities to help you work more confidently when making pay and overtime calculations.

In this section, you will find information and activities to help you work out pay and overtime calculations using information from timesheets and wage slips.

N2/L2.2,
N2/L2.3

tutor notes

Part 2

In Part 2 you can find suggestions of other free resources you can use to practise your skills.

Part 3

In Part 3 you can try out your skills on some practical activities, and check your progress with some test-type questions from the Progress Checks. Part 3 also contains the answers to all the activities in Parts 1 and 3.



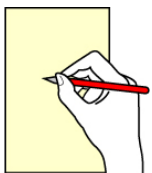
Build your skills: Pay calculations – Part 1



Thinking about working out pay calculations

Sometimes to work out a pay calculation you will need to work out the pay earned for parts of an hour worked (not just whole hours). You can make use of the fact that one hour = 60 minutes, and use what you know about fractions and decimals to help you work out the calculations you need.

Employee no.	Employee name	Process Date	National insurance num	
1748	Mr A N Other	30/11/2008	RV115620GY	
Basic Salary		Deductions	Amount	
Basic 7.5 hours at £6.50		PAYE Tax	7.00	
		National Insurance	7.70	
Mr A N Other	This Period		Year to Date	
	Total Gross Pay	3010.75	Total Gross Pay TD	1468.15
	Gross For Tax	2905.00	Gross For Tax TD	1468.15
	Earning for NI	2904.00	Tax paid TD	102.56
	Payment Period	Monthly	Earnings for NI TD	1468.15
			National Insurance TD	7.70
Acme Tools Ltd.			Net Pay 2363.51	
Tax code: 474L Dept:4 Tax Period:8 Payment Method: BACS				



Activity 1

Think about how many minutes make up different fractions of one hour.

For some amounts of time, it's fairly easy to think what fraction of an hour they represent because we are used to these when giving the time. For example, 15 minutes is one quarter ($\frac{1}{4}$) of an hour. Think, for example, of 'quarter past ten', i.e. 15 minutes after ten o'clock.



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To help you think about what fraction of an hour other numbers of minutes represent, it might help to use a visual approach. Think of the face of a clock to help you work out how many of a particular number of minutes go into a whole hour.

Example:



Altogether, six 10-minute slots fit into a whole hour.
So, **10 minutes is one-sixth of an hour.**



For each of the number of minutes in the table below, say what fraction of an hour it is.

The first line has been done for you as an example.

Number of minutes	Fraction of an hour
15 minutes	$\frac{1}{4}$
10 minutes	
30 minutes	
12 minutes	
20 minutes	
5 minutes	



Activity 2

You can also use equivalent fractions to help you relate numbers of minutes with fractions of an hour.

Example: 10 minutes as a fraction of an hour is: 10 minutes out of 60 minutes or $\frac{10}{60}$

You can 'simplify' this fraction to find equivalent fraction(s).



What number will go into the number above the line and the one below the line?

5 goes into both 10 and 60

(5 is a 'factor' of both 10 and 60)



So, dividing both top and bottom by 5 gives us the equivalent fraction.

$$\begin{array}{ccc} & \div 5 & \\ \hline \frac{10}{60} & = & \frac{2}{12} \\ \hline & \div 5 & \end{array}$$



Thinking about this equivalent fraction, are there any other numbers that will still go into both the top and the bottom?

$$\begin{array}{ccc} & \div 2 & \\ \hline \frac{2}{12} & = & \frac{1}{6} \\ \hline & \div 2 & \end{array}$$

You could still divide both top and bottom by 2.

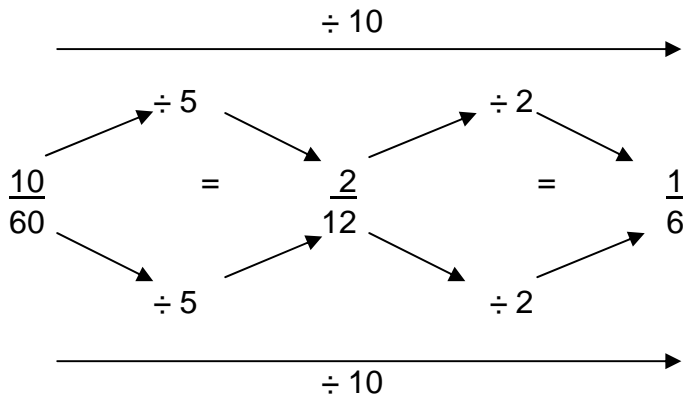
So, $\frac{10}{60}$ is equivalent to $\frac{1}{6}$

Note: It doesn't matter if you take two steps (as in the example above) to work out the 'simplest form' of the original fraction: the overall result is still the same.

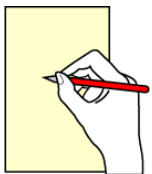


Build your skills: Pay calculations – Part 1

Think about the two steps you took in this example: divide by 5 and then divide by 2. This is the same as if you'd only used one step of dividing by 10.



Tip: Because time is measured in batches of 60 (one hour = 60 minutes), the number you divide by will be a factor of 60 each time.



For each fraction in the left column of the tables below, identify what factor(s) you could divide both top and bottom by to work out an equivalent fraction.

Try to 'simplify' each fraction in the right column as much as you can, i.e. keep looking for any other numbers that will go into both top and bottom until it won't simplify any further.

The first one has been done for you.

Fraction	Factor	Equivalent fraction
$\frac{10}{60}$	10	$\frac{1}{6}$
$\frac{30}{60}$		
$\frac{15}{60}$		
$\frac{12}{60}$		
$\frac{5}{60}$		

Fraction	Factor	Equivalent fraction
$\frac{20}{60}$		
$\frac{45}{60}$		
$\frac{40}{60}$		



Activity 3

Sometimes the amounts of time you are dealing with might be more than one hour. It's useful in this case to:

- start by working out the number of whole hours you have first (how many whole lots of 60 minutes go into the amount of time you have)

and then

- work out how many minutes are left and what fraction of an hour this represents.

Example: 75 minutes

60 minutes will be one whole hour, leaving 15 minutes, which is a quarter of an hour.

So, **75 minutes is the same as $1\frac{1}{4}$ hours.**

It might be useful to have in mind the multiples of 60, which will remind you how many minutes there are in different numbers of hours.



Hours	Minutes
1	60
2	120
3	



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Try using this approach to work out how many hours each number of minutes represents, in the table below.

The first one has been done for you.

Minutes	Hours
150 minutes	$2\frac{1}{2}$ hours
240 minutes	
90 minutes	
135 minutes	
165 minutes	
105 minutes	
195 minutes	
270 minutes	
300 minutes	
210 minutes	



Activity 4

If you are working out a pay calculation, you will need to use the hourly rate of pay. You may need to work out amounts of pay for fractional parts of an hour.

One approach can be to work out the pay:

- for the whole numbers of hours first

and then

- for the fractional part.

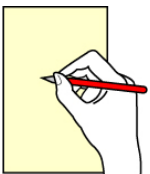
Example: You are paid £6.20 and have worked $2\frac{3}{4}$ hours.

Two hours' pay will be: $\text{£}6.20 \times 2 = \text{£}12.40$

Pay for a quarter of an hour will be: $(\text{£}6.20 \div 4 = \text{£}1.55)$

So, pay for three-quarters of an hour will be: $\text{£}1.55 \times 3 = \underline{\text{£} 4.65} +$

The **total pay for $2\frac{3}{4}$ hours** will be: **£17.05**



Try using this approach to work out the pay for these hours worked.

- 1 $2\frac{1}{2}$ hours at an hourly rate of pay of £5.60
- 2 $3\frac{1}{4}$ hours at an hourly rate of pay of £6.40
- 3 $5\frac{1}{2}$ hours at an hourly rate of pay of £7.20
- 4 $4\frac{3}{4}$ hours at an hourly rate of pay of £6.40
- 5 $7\frac{1}{4}$ hours at an hourly rate of pay of £5.60.



Activity 5

An alternative approach to work out the pay calculations above is to think about how the fractional part of the hour would be written as a decimal.

Example: You are paid £6.20 and have worked $2\frac{3}{4}$ hours.

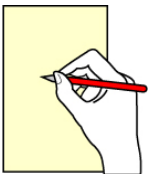
$2\frac{3}{4}$ hours is the same as 2.75 hours ($\frac{3}{4}$ is 0.75 when written as a decimal).

So, you could calculate the pay for the above work by working out:

$$£6.20 \times 2.75 = \mathbf{£17.05}$$

Note: This approach might be the one you would choose if you are using a calculator for your pay calculation. If you are working out the pay in your head you would probably opt for the approach used in Activity 4.

If you want to use the converting to decimals approach, you need to be confident about how fractions and decimals relate to each other.



Remind yourself of the relationship between decimals and common fractions by completing the following table.

Fraction	Decimal
$\frac{1}{2}$	
$\frac{3}{4}$	
$\frac{1}{4}$	
$\frac{1}{5}$	
$\frac{1}{10}$	

Note: If you are not sure of any of these, you can always work them out by thinking of the fraction as the top number divided by the bottom number.

Example: $\frac{3}{4}$



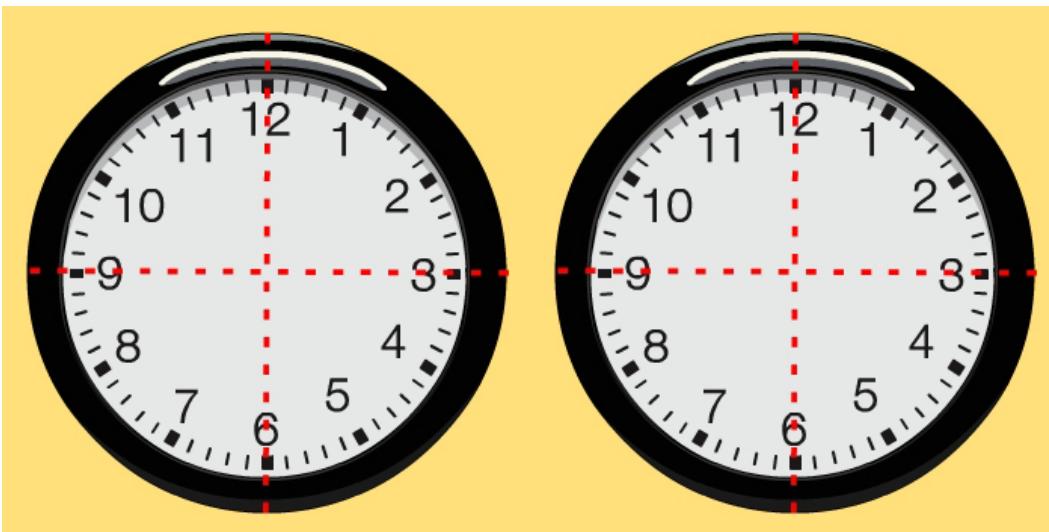
0.75

You can think of this as 3 divided by 4.



Activity 6

Sometimes you may need to add up amounts of time expressed as fractions to work out a total time. Again, you could use a visual approach to help you work these out.



It can also help you look for fractional amounts that add up to a whole hour.

For example:

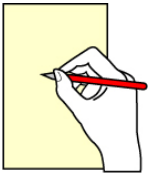
$$\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$$

$$\frac{3}{4} + \frac{1}{4} = 1$$

$$\frac{3}{4} + \frac{3}{4} = 1\frac{1}{2}$$



Build your skills: Pay calculations – Part 1



Practise combining common fractional parts of time.

- 1 Work out the total time for each of the following by adding up the amounts of time shown in the first column.

You could think about adding up the whole hours first and then working out what the fractional parts (when added together) add to this.

The first one has been done for you.

Times taken for individual jobs	Total time
$1\frac{1}{2}$ hours + $2\frac{1}{4}$ hours	$3\frac{3}{4}$ hours
$\frac{1}{2}$ an hour + $\frac{3}{4}$ of an hour	
$1\frac{1}{2}$ hours + $1\frac{1}{4}$ hours + $\frac{3}{4}$ of an hour	
$2\frac{1}{4}$ hours + $1\frac{1}{2}$ hours + 3 hours	
$1\frac{3}{4}$ hours + $1\frac{3}{4}$ hours	
$2\frac{1}{2}$ hours + $1\frac{1}{4}$ hours + $\frac{3}{4}$ of an hour	

- 2 Work out the total time worked by taking the amount of break time (column 2) off the time taken for work tasks (column 1).

The first one has been done for you.

Time taken for work tasks	Break time	Total time worked
$4\frac{1}{2}$ hours	$\frac{1}{2}$ an hour	4 hours
$7\frac{3}{4}$ hours	$\frac{1}{2}$ an hour	
$3\frac{1}{2}$ hours + $4\frac{1}{2}$ hours	$\frac{3}{4}$ of an hour	
$5\frac{1}{4}$ hours + $3\frac{1}{2}$ hours	$\frac{1}{2}$ an hour	
$4\frac{3}{4}$ hours + $2\frac{3}{4}$ hours	$\frac{3}{4}$ of an hour	



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Activity 7

Another common sort of calculation when working out pay can be when you get an enhanced rate for some reason for some of the hours you've worked. This means you get a rate that is higher than the normal hourly rate for these hours.

Employee no. 1748	Employee name Mr A N Other	Process Date 30/11/2008	National insurance num RV115620GY	
Basic Salary		Deductions		
Basic 30 hours at £6.20 and Bank holiday 7 hours at £9.30			Amount	
		PAYE Tax	7.00	
		National Insurance	7.70	
Mr A N Other	This Period		Year to Date	
	Total Gross Pay	3010.75	Total Gross Pay TD	1468.15
	Gross For Tax	2905.00	Gross For Tax TD	1468.15
	Earning for NI	2904.00	Tax paid TD	102.56
	Payment Period	Monthly	Earnings for NI TD	1468.15
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For example, if you work on a bank holiday you might get paid at 'time and a half'. So, for the hours you worked on that day you will get paid half as much again as the normal hourly rate.

Example: Normal hourly rate is £6.20 per hour. 'Time and a half' would be:

'Time' (i.e. the normal hourly rate) = £6.20
 'and a half' (i.e. half of the normal rate) = £3.10 +

So your rate at 'time and a half' would be £9.30 per hour

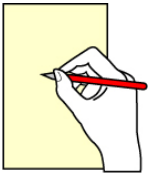
If you worked seven hours during the bank holiday, your pay would be:

$$7 \times £9.30 = £65.10$$

(Any hours you worked on other days would still be paid at the normal hourly rate of £6.20.)



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Work out what the pay would be in these examples

- 1 a) What is the pay per hour at 'time and a half' if the normal rate is £5.80 per hour?
b) How much would you earn for six hours' work at 'time and a half'?
- 2 a) What is £6.40 per hour at 'time and a quarter'?
b) How much would you earn for eight hours' work at 'time and a quarter'?
- 3 a) What is £7.20 per hour at 'time and a third'?
b) How much would you earn for seven hours' work at 'time and a third' plus another ten hours worked at the normal hourly rate?

One point to note: If you are using a calculator to work out pay calculations, you need to be a bit careful interpreting the answers if they are in hours.

On the calculator, the answer you get is in decimals, which is not the same as hours and minutes. This is because time is counted in batches of 60 (i.e. one hour = 60 minutes), rather than in multiples of 10 or 100, like metric measurements or money.

Example: I get paid at an hourly rate of £6.00. My pay slip says I've earned £75. How many hours have I been paid for?

If you worked this out with a calculator, you might put in:

$$\boxed{75} \div \boxed{6} = \boxed{12.5} \dots \text{and get the answer } \boxed{12.5}$$

This answer is in hours, so the part after the decimal point doesn't mean 50 minutes!

It is 0.5 of an hour (a decimal part of an hour, i.e. the same as the fraction $\frac{1}{2}$).

So, 12.5 hours means **12½ hours**.

If the answer you get is in money (like in activities 4 and 6 above), this is not an issue. So, when you use a calculator for any situations that involve time in some way, think carefully about what units the answer will be in. This will help to make sure you interpret the answer correctly.

Now print out Part 2 of this task to find suggestions of other free resources you might want to use to practise the skills covered in Part 1.