



**SET Y**

**Level 3 Certificate**  
**MATHEMATICAL STUDIES**

**Paper 1**

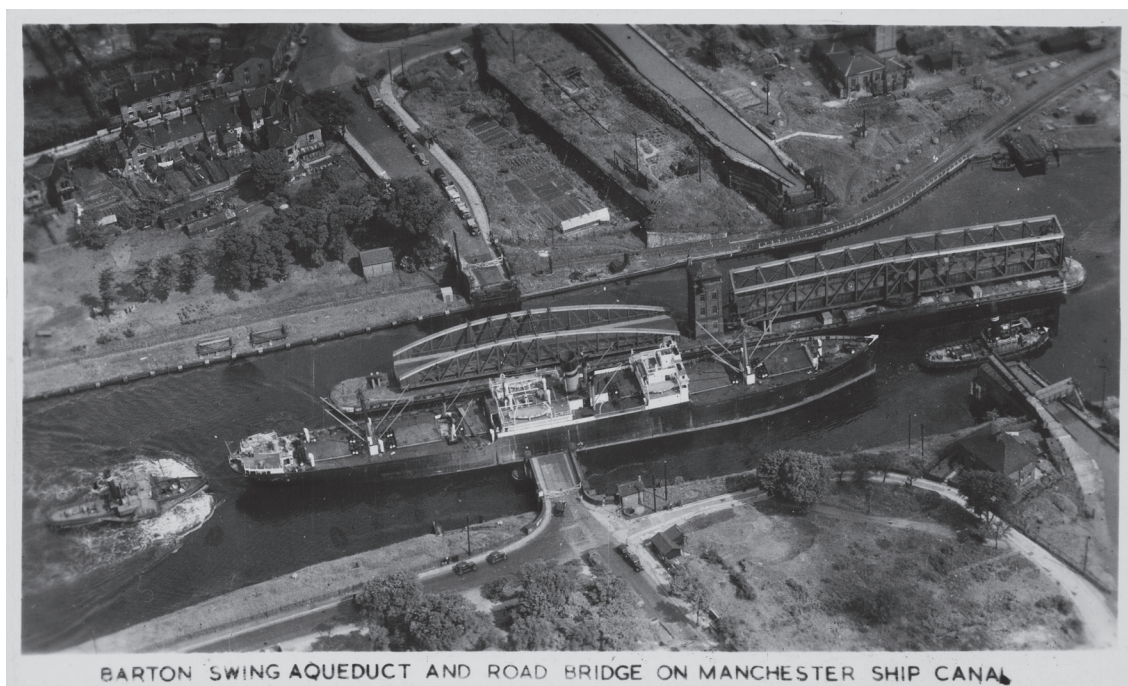
**Preliminary material**

**Instructions**

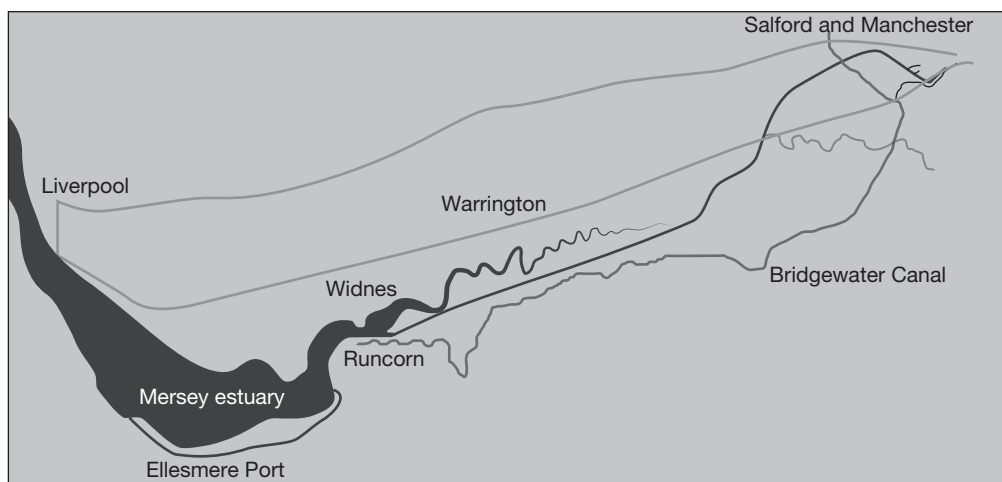
- This preliminary material will be given to you before your exam.
- You must not take annotated preliminary materials into the exam.  
You will be given a clean copy by your teacher.

# Preliminary material Paper 1

## The Manchester Ship Canal



The photograph shows the first and only swing aqueduct in the world. In this picture it has been swung open to allow the passage of a ship heading towards Manchester. The Barton swing aqueduct was just one of the many engineering feats that enabled Victorian entrepreneurs to turn Manchester, a city which is 64 km inland, into Britain's third largest port.



The canal was completed in 1894 at a cost of £15 million. In today's money (2016) this is estimated to be approximately £1.7 billion.

Although the construction involved the use of steam powered machinery, much of the excavation involved manual labour. The workforce numbered around 16 000 men (and boys). 130 of the workforce died in accidents and roughly 1000 were seriously injured.

Today, Salford Quays is being redeveloped as Media City UK. After years of decline, only some 7% of the carrying capacity of the Ship Canal is currently used. However, the Atlantic Gateway project is a £50 billion planned major development to reduce road traffic and CO<sub>2</sub> emissions by carrying goods directly into the heart of Northern England on container ships.

## Taxation 2015-16

### National Insurance 2015-16

Percentage National Insurance Due	Minimum Weekly Income	Maximum Weekly Income	Minimum Monthly Income	Maximum Monthly Income
<b>Non-contracted out</b>				
Nil		Below £112		Below £486
0%	£112	£155	£486	£672
12%	£155.01	£815	£672.01	£3532
2%	above £815		above £3532	
<b>Contracted out</b>				
10.6%	£155.01	£770	£672.01	£3337

Note: A person is '**contracted out**' if they are a member of a contracted out occupational pension scheme or personal/stakeholder pension. They pay a slightly lower rate of National Insurance as the state does not have to pay them as much pension.

A person with a weekly income of, say, £320 a week will pay 12% on the amount above £155.

A person with a weekly income of, say, £940 a week will pay 12% on the amount between £155.01 and £815 plus 2% of the amount above £815.

### Income tax 2015-16

Most people have a personal allowance. This is an annual amount of tax-free income. The personal allowance for 2015-16 was £10 600. The rates of income tax you pay depend on how much taxable income you have above your personal allowance.

### Income tax rates and taxable bands 2015-16

Rate	Taxable Income
Basic: 20%	£0-£31 785
Higher: 40%	£31 786-£150 000
Additional: 45%	Over £150 000

### To calculate your income tax if your annual income is £100 000 or less

Find your taxable income by subtracting your personal tax allowance from your annual income.

You pay income tax at 20% on the first £31 785 of your taxable income.

You pay income tax at 40% on your taxable income over £31 785.

### Student loans

Student loans are paid back at a rate of 9% of gross earnings in excess of £21 000 per year.

Interest is added to the loan from the time when earnings start.

### Net pay

Your net pay or take home pay is the money you earn after any deductions for income tax, National Insurance and student loan repayments.