# Mock Grade 6

# Maths Booklet 5

Paper 2H
Calculator

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**1** Katy invests £5000 in a savings account for 3 years.

The account pays compound interest at an annual rate of

> 4.2% for the first year
>
> $x$% for the second year
>
> $x$% for the third year

There is a total amount of £5853.96 in the savings account at the end of 3 years.

(a) Work out the rate of interest in the second year.

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**(4)**

Katy goes to work by train.
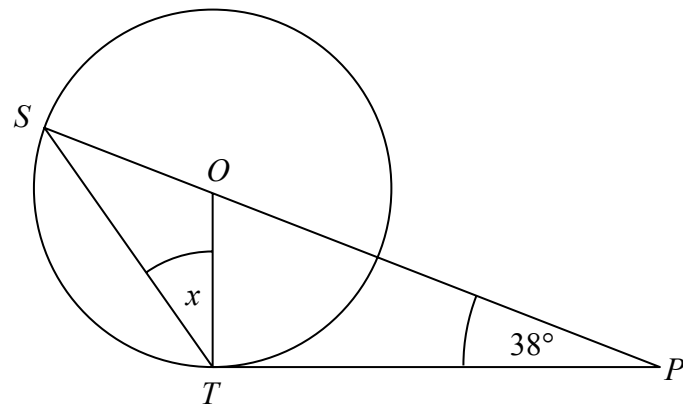
The cost of her weekly train ticket increases by 8% to £405

(b) Work out the cost of her weekly train ticket before this increase.

£.......................................................

**(2)**

**(Total for Question 1 is 6 marks)**

**2**



*S* and *T* are points on the circumference of a circle, centre *O*.
*PT* is a tangent to the circle.
*SOP* is a straight line.
Angle *OPT* = 38°

Work out the size of the angle marked *x*.
You must give a reason for each stage of your working.
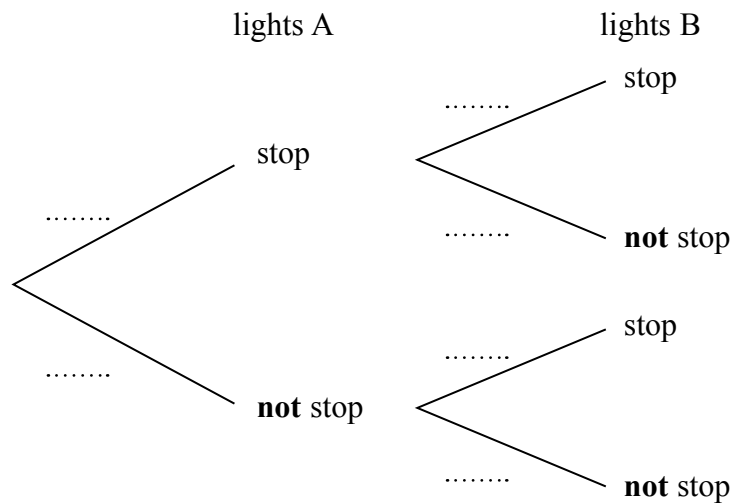
**(Total for Question 2 is 4 marks)**

**3** A and B are two sets of traffic lights on a road.

The probability that a car is stopped by lights A is 0.55

If a car is stopped by lights A, then the probability that the car is **not** stopped by lights B is 0.72

If a car is **not** stopped by lights A, then the probability that the car is **not** stopped by lights B is 0.3

(a) Complete the probability tree diagram for this information.

```
          lights A              lights B
                                       stop
                         ........
                stop  <
        ........      ........    not stop
    <
        ........               stop
              not stop ........
                     < 
                       ........  not stop
```

**(2)**

Mark drove along this road.
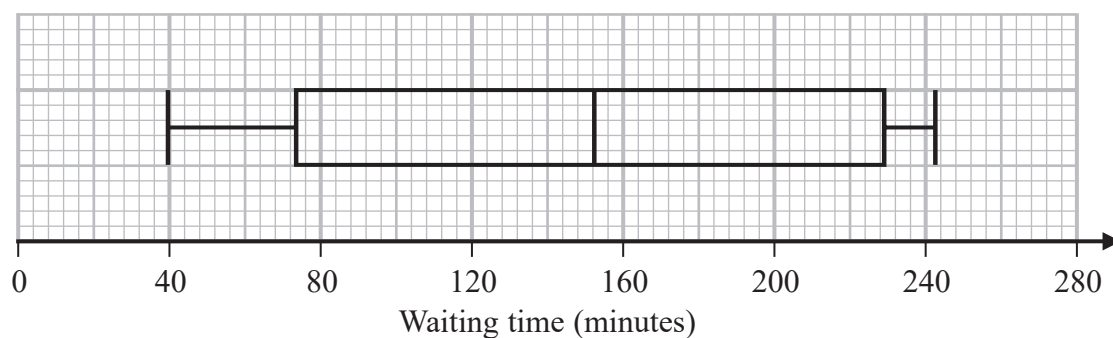He was stopped by just one of the sets of traffic lights.

(b) Is it more likely that he was stopped by lights A or by lights B?
   You must show your working.

**(3)**

**(Total for Question 3 is 5 marks)**

**4**  The box plot shows information about the length of time, in minutes, some people waited to see a doctor at a hospital on Monday.



Waiting time (minutes)

(a) Work out the interquartile range of the information in the box plot.

.................................................. minutes

**(2)**

Becky says,
"25% of the people waited for at least 1 hour."

(b) Is Becky correct?
Explain why.

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**(1)**

The table gives information about the length of time, in minutes, some people waited to see a doctor at the same hospital on Tuesday.

|  | Waiting time (minutes) |
|---|---|
| Shortest time | 18 |
| Lower quartile | 40 |
| Median | 90 |
| Upper quartile | 150 |
| Longest time | 240 |

Becky was asked to compare the distribution of the lengths of times people waited on Monday with the distribution of the lengths of times people waited on Tuesday.

She wrote,
            "People had to wait longer on Tuesday than on Monday."

(c) Give **one** reason why Becky may be wrong.

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**(1)**

**(Total for Question 4 is 4 marks)**

**5** Louise invests £x in Better Investments for 3 years.
Sadiq invests £x in County Bank for 3 years.

<div>

**Better Investments**

Compound Interest

3% per annum

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**County Bank**

Compound Interest

1.6% per annum for the first two years
2% per annum for each extra year
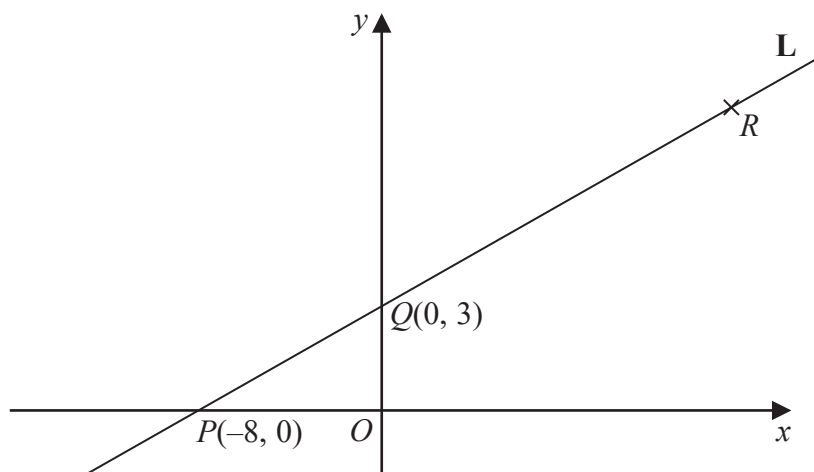
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At the end of the 3 years, the value of Louise's investment is £822 579

Work out the value of Sadiq's investment at the end of the 3 years.

£ .......................................................

**(Total for Question 5 is 4 marks)**

**6** Here is a sketch of the line **L**.



The points $P(-6, 0)$ and $Q(0, 3)$ are points on the line **L**.

The point $R$ is such that $PQR$ is a straight line and $PQ : QR = 2 : 5$

(a) Find the coordinates of $R$.

(............................ , ............................)

**(2)**

(b) Find an equation of the line that is perpendicular to **L** and passes through $Q$.

.........................................................................................................

**(3)**

**(Total for Question 6 is 5 marks)**

**7** Expand and simplify $(x - 5)(2x + 1)(3x + 5)$

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**(Total for Question 7 is 3 marks)**

**8** In a school there are 32 teachers and 180 students.
Of these students 80 are girls and 100 are boys.

One teacher, one girl and one boy are going to be chosen to represent the school.

Work out the number of different ways there are to choose one teacher, one girl and one boy.

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**(Total for Question 8 is 2 marks)**