1.
Amelia is making cupcakes. She reads the instructions.

Ingredients
To make 12 cupcakes:
200g flour
250g sugar
220g butter

Amelia has 1.5 kilograms of flour, 2 kilograms of sugar and 1.75 kilograms of butter.
What is the maximum number of cupcakes she can make?

Flour: $1,500 \div 200 = 7.5$
Sugar: $2,000 \div 250 = 8$
Butter: $1,750 \div 220 = 7.954$

$7.5 \times 12 = 90$ cupcakes

(4)

2.
A box is placed on a table.
The area of the box in contact with the table is 2,700 cm².
The pressure on the table is 4,000 N/m².

Find the force exerted by the box on the table.

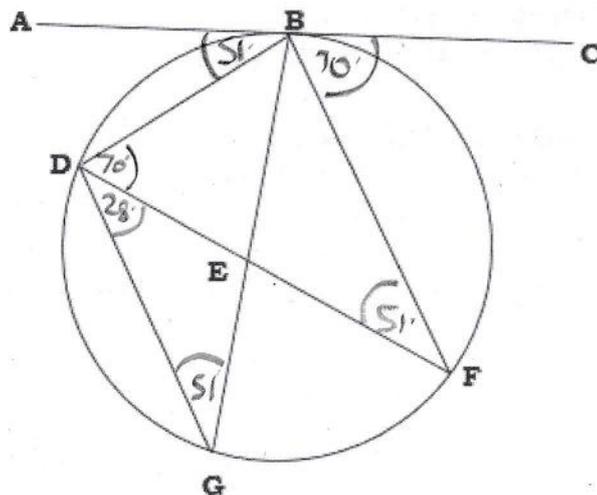$2,700 \div 100^2 = 0.27 m^2$

$p \quad F \quad A$

Force $= 4,000 \times 0.27 = 1,080 N$

(3)

3.
Show that $(x + 4)(x + 6)$ can be written in the form $(x + a)^2 + b$.

$(x+4)(x+6) = x^2 + 4x + 6x + 24$
$= x^2 + 10x + 24$
$= (x+5)^2 - 5^2 + 24$
$= (x+5)^2 - 1$

(3)

4.

ABC is a tangent to the circle.
Angle BFD = 51°.
Angle BDG = 98°.
Angle FBC = 70°.

(a) Find the size of angle ABD.

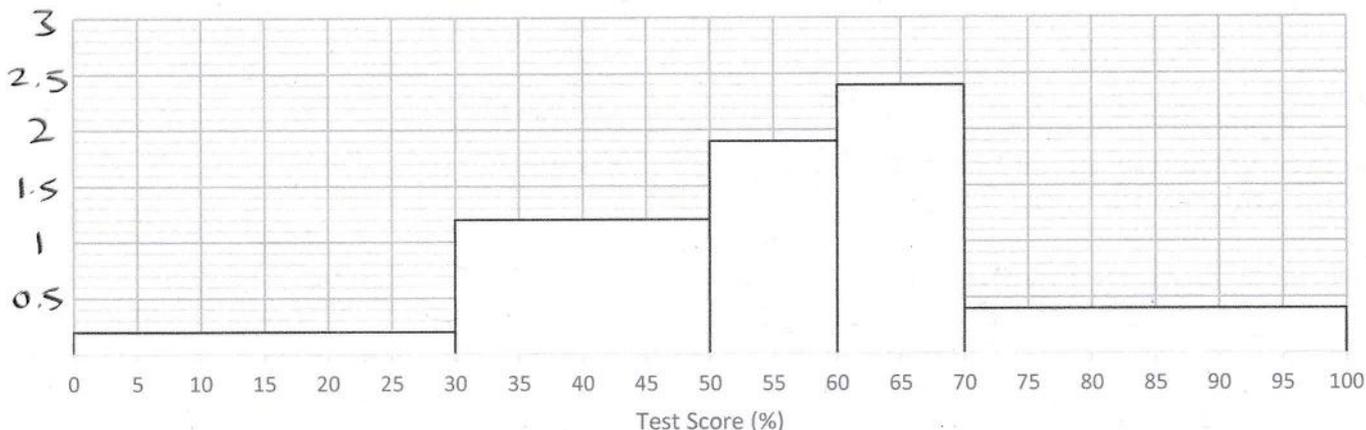$$51°$$

(1)

(b) Find the size of angle DGB.

$$51°$$

(1)

(c) Find the size of angle GEF.

$$28 + 51 = 79$$
$$180 - 79 = 101$$
$$180 - 101 = 79°$$

$$GEF = 79°$$

(3)

5.

Every student in Year 10 took a maths exam.
The exam results are shown in the histogram below.

12 students scored more than 70%.
The pass mark for the exam was 45%.
Estimate how many students failed the exam.

$$FD = Frequency \div Width$$
$$= 12 \div 30$$
$$= 0.4$$

$$30 \times 0.2 = 6$$
$$15 \times 1.2 = 18$$

$$6 + 18 = 24 \text{ students}$$

(5)