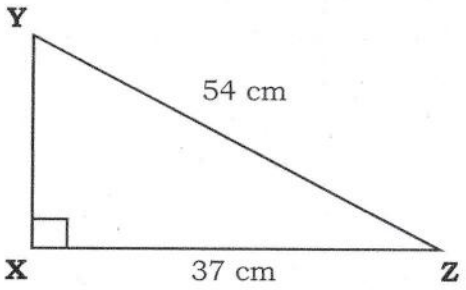
HIGHER TIER
MINI PRACTICE EXAM 3

CALCULATOR ALLOWED
20 MINUTES ALLOWED

metatutor

1.
Find YX to 2 significant figures.



$54^2 = 2916$
$37^2 = 1369$
$- = 1547$
$\sqrt{1547} = 39.33... = 39\text{ cm}$

(3)

2.
Ricky has forgotten his password for his computer.
His password contains 6 numbers.
There are no zeros in his password.
The last digit of the password is an even number.
Work out how many different passwords are possible.

$9 \times 9 \times 9 \times 9 \times 9 \times 4 = 236,196$

(2)

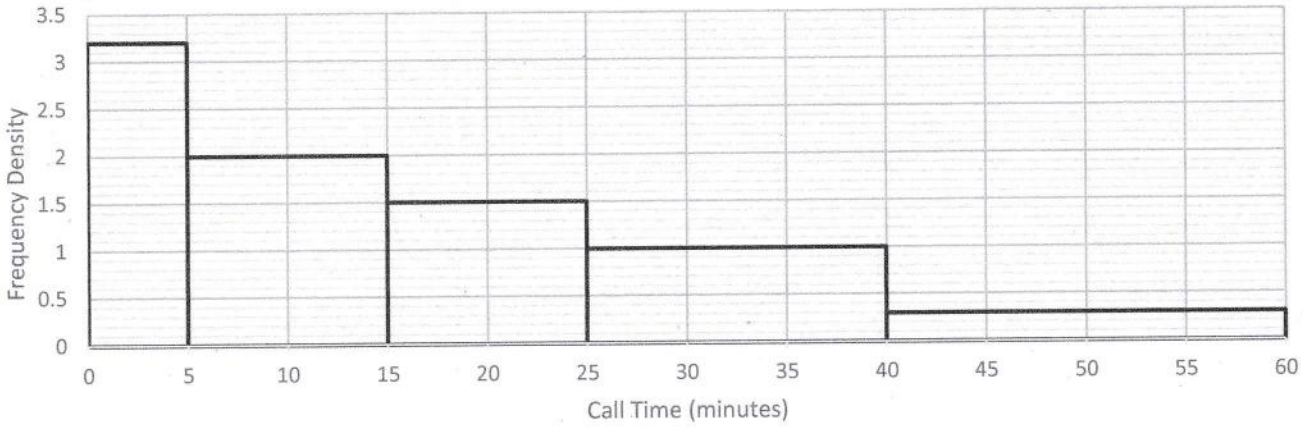
3.
Expand and simplify $(2x - 1)(3x + 2)(x - 4)$

$(2x-1)(3x+2) = 6x^2 - 3x + 4x - 2$
$= 6x^2 + x - 2$

$(6x^2+x-2)(x-4) = 6x^3 + x^2 - 2x - 24x^2 - 4x + 8$
$= 6x^3 - 23x^2 - 6x + 8$

(4)

4.
A call centre monitored the time spent on each call one day.
The results are shown on the histogram below.



(a) How many calls lasted less than 5 minutes?

$3.2 \times 5 = 16$

(2)

(b) Estimate how many calls lasted more than 30 minutes.

$10 \times 1 = 10$

$0.3 \times 20 = 6$

$10 + 6 = 16$

(3)

5.
f, g and h are functions.

$f(x) = x^2 - 13$ $\quad g(x) = x + 1$ $\quad h(x) = \frac{5}{x}$

(a) Find h(0.5) $5 \div 0.5 = 10$

(1)

(b) Solve fg(x) = 0, giving your solutions to 1 decimal place.

$fg(x) = f(g(x)) = f(x+1) = (x+1)^2 - 13$

$= x^2 + x + x + 1 - 13$

$= x^2 + 2x - 12$

$x^2 + 2x - 12 = 0$

$a = 1$
$b = 2$
$c = -12$

$x = \frac{-2 \pm \sqrt{2^2 - 4 \times 1 \times -12}}{2 \times 1} = 2.6$ or -4.6

(5)