

**HIGHER TIER
MINI PRACTICE EXAM 8**



**CALCULATOR ALLOWED
20 MINUTES ALLOWED**

1.
Ashley is playing a game.
He is going to roll two fair six-sided dice.
He will then multiply the results together, giving a final score.
Ashley will win the game if his score is a multiple of 4.

Work out the probability that Ashley wins the game.

(3)

2.
(a) Show that the equation $x^3 + 5x - 11 = 0$ has a solution between 1 and 2.

(1)

(b) Show that $x^3 + 5x - 11 = 0$ can be written in the form $x = \sqrt[3]{11 - 5x}$.

(2)

(c) Hence use the iterative formula $x_{n+1} = \sqrt[3]{11 - 5x_n}$ with a suitable x_0 to find the solution to the equation $x^3 + 5x - 11 = 0$ to 2 decimal places.

(3)

3.

A solid cube of wood has a mass of 1,372g and a density of 4 g/cm³.
Find the surface area of the block of wood.

(4)

4.

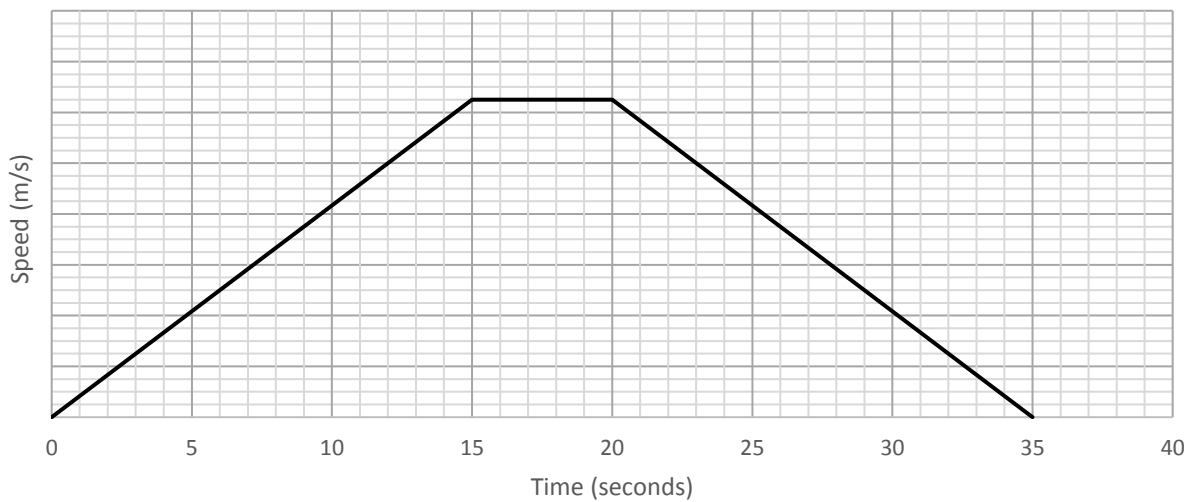
Factorise fully: $5x^3 - 80x$

(2)

5.

James ran 250 metres.

The velocity-time graph below shows how his velocity varied across the run.



(a) What was James's maximum speed?

(3)

(b) Find James's acceleration in the first 15 seconds of the run, to 2 decimal places.

(2)