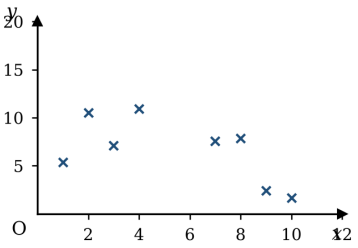
Day 51 **A Level Maths: B Tier 10-a-day**

1 Find the exact value of sec 60°,
giving your answer with a rational denominator.

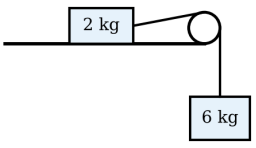
2 The scatter diagram shows eight pairs of values of x and y.
(a) Describe the correlation.
(b) Why should $y = 12 - x$ not be used for $x = 20$?



3 Simplify $\frac{(4x^3)^2 \times 3x^2}{3x^4}$.

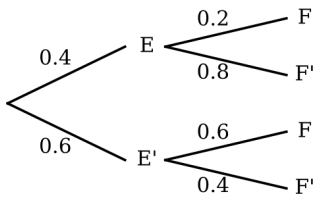
4 Solve $e^{2x} - 2e^x - 8 = 0$,
giving any answers as exact values.

5 A particle of mass 2 kg lies on a smooth horizontal table. It is attached by a light string over a smooth pulley at the edge of the table to a particle of mass 6 kg hanging freely.
Take $g = 9.8$ m s^{-2}.
The system is released from rest. Find the acceleration and the tension in the string.



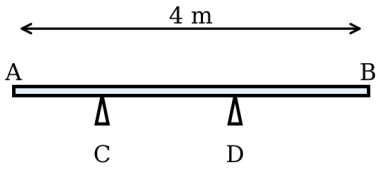
Day 51 **A Level Maths: B Tier 10-a-day**

6 The tree diagram shows probabilities for event E, followed by event F.
Find the probability that exactly one of E and F occurs.



7 Line l_1 has equation $x + 2y = -5$ and line l_2 has equation $4x + y = 8$.
The lines meet at P. Find the area of the triangle formed by l_1, l_2 and the x-axis.

8 A uniform plank AB of length 4 m and mass 20 kg rests horizontally on supports at C and D, where AC = 1 m and DB = 1.5 m.
A girl of mass 10 kg walks from D towards B.
Find how far she is from D when the plank is about to tilt.



9 Line l_1: $\mathbf{r} = \begin{pmatrix} -5 \\ 0 \\ -1 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix}$.

Line l_2: $\mathbf{r} = \begin{pmatrix} 3 \\ 1 \\ -1 \end{pmatrix} + \mu \begin{pmatrix} -2 \\ 2 \\ 0 \end{pmatrix}$.

Show that l_1 and l_2 intersect and find the point.

10 Prove by contradiction that there are no integers x and y such that $x^2 - y^2 = 34$.