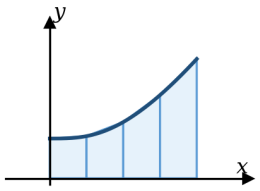
Day 21	A Level Maths: B Tier 10-a-day

1 Simplify $\frac{(4x)^3 \times 2x}{4x^6}$.

2 Items numbered 1 to 96; systematic sample of size 16.
(a) Find the sampling interval.
(b) The first item is number 3. Find the 7-th item.

3 The diagram shows the trapezium rule with 4 strips.

Use it to estimate $\int_0^2 \sqrt{1 + x^3}\, dx$, to 3 s.f.

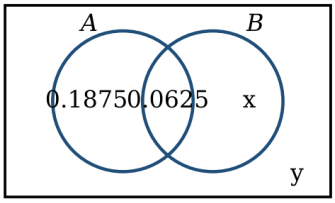


4 Find the quotient and the remainder when $2x^3 + 12x^2 - 2x - 10$ is divided by $(2x + 2)$.

5 A ball is thrown horizontally at 28 m s^{-1} from the top of a cliff 78.4 m above level ground.
Take g = 9.8 m s^{-2}.
Find the time of flight and the horizontal distance from the base where it lands.

Day 21	A Level Maths: B Tier 10-a-day

6 The Venn diagram shows probabilities for events A and B, which are independent.
Find the values of x and y.



7 A stone is projected from level ground with horizontal velocity component 12 m s^{-1} and vertical velocity component 9.8 m s^{-1} upwards.
Take g = 9.8 m s^{-2}.
Find (a) the time of flight, (b) the horizontal range.

8 Solve the equation $2^{2x} + 2\times2^{x} - 8 = 0$.

9 A curve has parametric equations
$x = t^3$, $y = t^2 + 2t$.
Find $\frac{dy}{dx}$ in terms of t, and the equation of the tangent at t = 2.

10 The radius of a circular oil slick increases at 0.25 cm per second.
Find the rate at which its area is increasing when r = 4 cm, in terms of π.