

INTEGRATION – WORKSHEET

COURSE/LEVEL

NSW Secondary High School Year 12 HSC Mathematics. Syllabus reference: 11.1 – 11.4.

1. Find the primitives of:

(i) $\sqrt[3]{x^5}$ (ii) $\frac{5}{x^3}$

(iii) $(1-x)^8$ (iv) $\sqrt{3x-1}$

2. Find the area bounded by the curve $y = 3x - x^2$ and the x -axis.

3. Complete the following table:

x	0	1	2	3	4
$f(x) = \frac{1}{x-1}$					

Hence evaluate $\int_0^4 \frac{dx}{x+1}$ using 5 function values of Simpson's Rule.

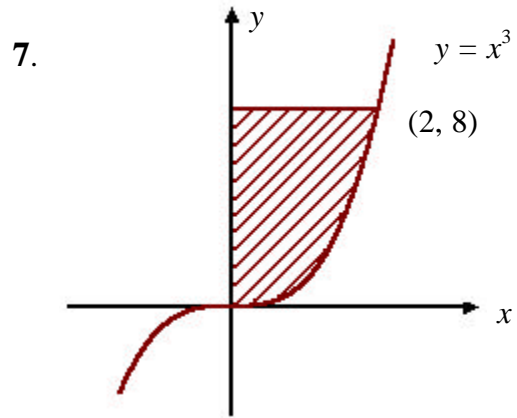
4. Find the area enclosed between the parabola $y = x^2 + 2x$ and the straight line $y = x$.

5. If $f''(x) = 6x - 8$ and $f'(0) = 6$, $f(1) = 1$, find $f(x)$.

6. Evaluate:

(i) $\int_1^2 2x(x^2 + 3)dx$

(ii) $\int_{-1}^1 \sqrt{5x+8} dx$



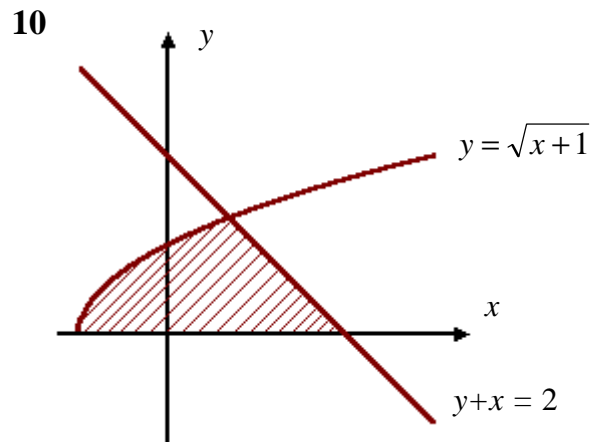
Find the area of the shaded region.

8. The area bounded by the parabola $y = 9 - x^2$ and the x -axis is rotated about the x -axis. Find the volume generated.

9. If $y = \sqrt{1 - 4x^2}$,

(a) find $\frac{dy}{dx}$.

(b) Hence evaluate $\int_0^{\frac{1}{2}} \frac{x dx}{\sqrt{1 - 4x^2}}$.



Calculate the area of the shaded region.