(There are many solutions. This is one.)

3. Subdivide $[1,3]$ into 4 equal pieces at $\frac{3}{2}, 2, \frac{5}{2}$ and use midpoints $5/4$, $7/4$, $9/4$ and $11/4$.

$$f\left(\tfrac{5}{4}\right)\left(\tfrac{3}{2}-1\right) + f\left(\tfrac{7}{4}\right)\left(2-\tfrac{3}{2}\right) + f\left(\tfrac{9}{4}\right)\left(\tfrac{5}{2}-2\right) + f\left(\tfrac{11}{4}\right)\left(3-\tfrac{5}{2}\right)$$

$$= \frac{4}{5}\cdot\frac{1}{2} + \frac{4}{7}\cdot\frac{1}{2} + \frac{4}{9}\cdot\frac{1}{2} + \frac{4}{11}\cdot\frac{1}{2}$$

$$= \boxed{\frac{2}{5}+\frac{2}{7}+\frac{2}{9}+\frac{2}{11} = \frac{3776}{3465} \approx 1.08}$$

Riemann sum for $\int_1^3 \frac{1}{x}\,dx$

4. $\int_1^2 f(x)\,dx = \int_1^5 f(x)\,dx - \int_2^5 f(x)\,dx = 10-8 = \boxed{2}$

5. $\int_1^3 f(x)-2g(x)\,dx = \int_1^3 f(x)\,dx - 2\int_1^3 g(x)\,dx = 7-2(4) = \boxed{-1}$

6. Increasing $\Rightarrow$ left end underestimates, right overestimates.

Under $= f(0)(3-0) + f(3)(5-3) + f(5)(8-5) + f(8)(10-8)$

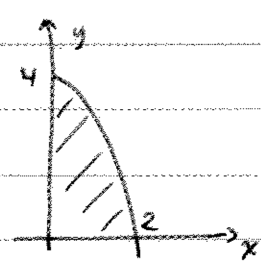
$= 1(3) + 2(2) + 4(3) + 5(2)$

$= 3+4+12+10 = \boxed{29}$

Over $= f(3)(3-0) + f(5)(5-3) + f(8)(8-5) + f(10)(10-8)$

$= 2(3) + 4(2) + 5(3) + 8(2)$

$= 6+8+15+16 = \boxed{45}$

7. 

Area $= \int_0^2 4-x^2\,dx = 4x - \frac{x^3}{3}\Big|_0^2 = 8-\frac{8}{3} = \boxed{\frac{16}{3}}$