Each problem is worth 5 points. Clear and complete justification is required for full credit.

x	1	2	3	4	5	6
$f(x)$	4	6	1	2	3	5
$g(x)$	2	4	6	3	1	5

1. Use the table above to evaluate

a) $f \circ g(2) = f(g(2)) = f(4) = \boxed{2}$

b) $g \circ f(2) = g(f(2)) = g(6) = \boxed{5}$

2. Find an exponential function for the form $f(x) = C\,a^x$ passing through the points $(0,3)$ and $(2,12)$.

Since it goes through $(0,3)$:

$(3) = C \cdot a^{(0)}$

$\therefore C = 3$

Since it goes through $(2,12)$:

$(12) = 3 \cdot a^{(2)}$

$4 = a^2$

$\therefore a = 2$

$$\boxed{f(x) = 3 \cdot 2^x}$$

3. Evaluate $\log_2 \frac{1}{4}$ exactly.

$$\log_2 \frac{1}{4} = \underbrace{\log_2}_{} 2^{-2} = \boxed{-2}$$

means "What's the exponent you'd put on 2 to get..."

4. Evaluate $\ln \sqrt{e}$ exactly.

$$\ln \sqrt{e} = \underbrace{\log_e}_{} e^{1/2} = \boxed{\frac{1}{2}}$$

means "What's the exponent you'd put on e to get..."