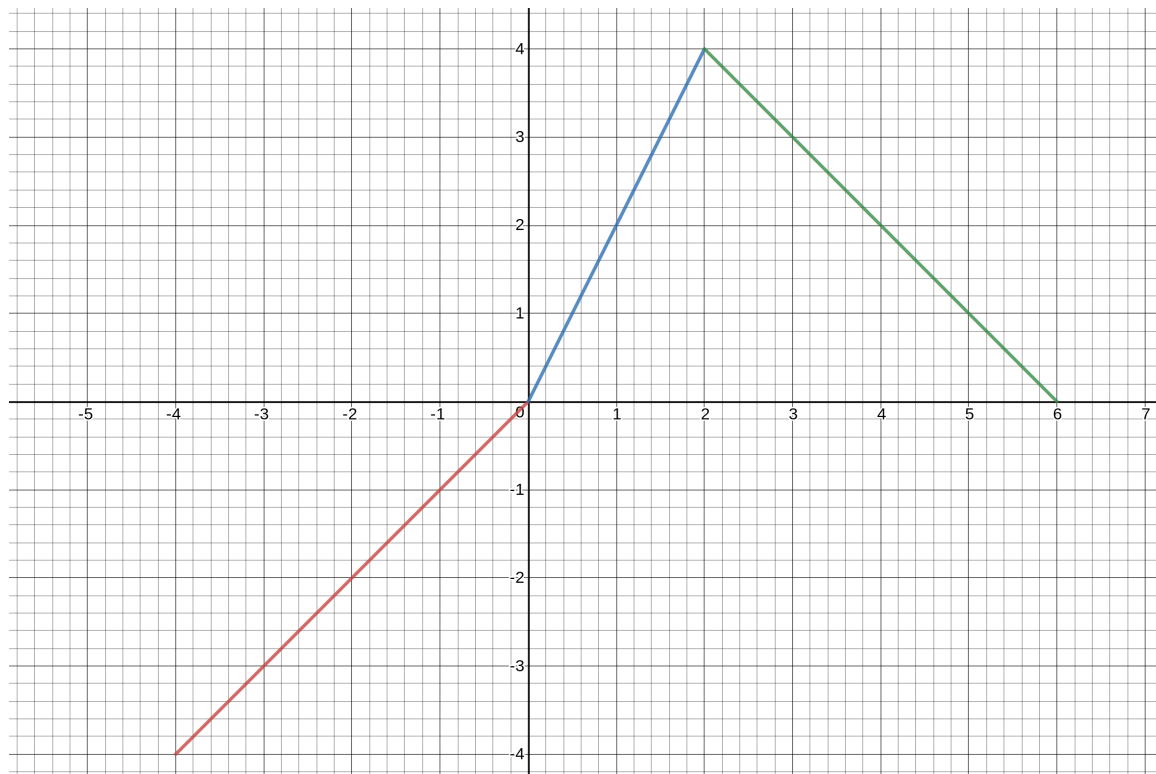Below is a graph of $f(x)$.

Define $g(x) = \displaystyle\int_{-1}^{x} f(t)\, dt$ and answer the following questions:

$g(1) =$

$g(2) =$

$g(3) =$

$g(-4) =$

$g'(2) =$

$g'(-1) =$

Give the intervals of increase and decrease for g:

Compute the following:

$$\frac{d}{dx}\left(\int_1^x \frac{1}{t^2 + 1}\, dt\right)$$

$$\frac{d}{dx}\left(\int_x^{x^2} \frac{1}{t^2 + 1}\, dt\right)$$

$$\int_0^1 x^2 + 3\, dx$$

$$\int_1^4 \frac{1}{\sqrt{x}} + 2x\, dx$$

$$\int_4^9 \frac{1 + x^2}{\sqrt{x}}\, dx \text{ (you don't need to simplify)}$$