$$12x^2 - 24x + 6$$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-24) \pm \sqrt{(-24)^2 - 4(12)(6)}}{2(12)}$$
$$x = \frac{24 \pm \sqrt{288}}{24}$$

therefore the roots are,

$$x = \frac{24+\sqrt{288}}{24} \text{ and } x = \frac{24-\sqrt{288}}{24}$$
$$x \approx 1.707106781 \text{ and } x \approx 0.292893218$$

Checking

$f(1.707106781) = 12(1.707106781)^2 - 24(1.707106781) + 6 \approx -3.1659 \cdot 10^{-09}$
$f(0.292893218) = 12(0.292893218)^2 - 24(0.292893218) + 6 \approx 1.38047462879 \cdot 10^{-08}$

i think thats it.