2. [8 points] The parts of this problem are **unrelated** to each other. For each part find your answers in **exact** form.

a. [3 points] Let $Q = \frac{7}{4}e^{0.1(t-2)}$. Find the initial value and the growth factor of Q.

Initial value: $\frac{7}{4}e^{-0.2}$

Growth factor: $e^{0.1}$

b. [5 points] Let $p(x)$ be a power function that passes through the points (5,8) and (10,32). Find a formula for $p(x)$. Be sure to **show all your work**.

Solution: The function $p(x)$ has the form kx^p for some constants k, p. Using the two points given we get:

$8 = k \cdot 5^p$ and $32 = k \cdot 10^p$.
Therefore, $\frac{32}{8} = \frac{10^p}{5^p}$ or equivalently $4 = 2^p$ which leads to $p = 2$.
Now by substituting $p = 2$ to the first equation, we obtain $8 = k \cdot 25$ and finally get $k = \frac{8}{25}$.

$p(x) =$ $\frac{8}{25}x^2$