

"The population of Yukon has increased 21% over the last 10 years to 42,052."

When will it reach 100,000?

$$y = A b^x \quad 2021: x=0 \Rightarrow A = 42,052$$

$$\text{Ten years ago } y = \frac{42,052}{1.21} = 34,754$$

$$\frac{42,052}{34,754} = \cancel{34,754} b^{10}$$

$$\left(\frac{42,052}{34,754} \right)^{1/10} = (\cancel{b^{10}})^{1/10} = b$$

$$\underbrace{1.019244052}_{\approx 1.9\%} = b$$

$$\approx 1.9\% < 21\%/10 = 2.1\%$$

$$\frac{100,000}{42,052} = \cancel{42,052} (1.019\dots)^x$$

$$\frac{\log\left(\frac{100,000}{42,052}\right)}{\log 1.019\dots} = \cancel{\left(\frac{100,000}{42,052}\right)} \log \cancel{(1.019\dots)}^*$$

$$x \approx 45.45$$

Pop'n of 100k in $2021 + 45 = 2065$