**Answer to exercise 4.30 and 4.32**

**4.30 (Global Warming Facts Quiz)**

**1. Research and Create the Quiz:**

Here's a sample five-question multiple-choice quiz on global warming, designed to be objective and represent both sides of the issue.

1. **Which gas is considered the primary driver of the current global warming trend?**
   1. Oxygen
   2. Nitrogen
   3. Carbon Dioxide
   4. Argon
2. **Some scientists argue that natural factors, such as solar activity, have a greater impact on global temperatures than human activity. True or False?**
   1. True
   2. False
3. **The Intergovernmental Panel on Climate Change (IPCC) has concluded that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are1unprecedented over decades to millennia.2What is the level of certainty they assign to human influence on the climate?**

[1. www.nipaers.com](https://www.nipaers.com/ebook/9789389130713" \o "https://www.nipaers.com/ebook/9789389130713)

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[2. books.google.com](http://books.google.com/books?id=UvxF7pem0GgC" \o "http://books.google.com/books?id=UvxF7pem0GgC)

[books.google.com](http://books.google.com/books?id=UvxF7pem0GgC" \o "http://books.google.com/books?id=UvxF7pem0GgC)

* 1. Low confidence
  2. Medium confidence
  3. High confidence
  4. Virtually certain

1. **Critics of climate change action often argue that proposed solutions will have a negative impact on which of the following?**
   1. Economic growth
   2. Public health
   3. Biodiversity
   4. Ocean acidity
2. **Which of the following is a potential consequence of rising sea levels due to global warming?**
   1. Increased agricultural productivity
   2. Displacement of coastal populations
   3. Expansion of polar ice caps
   4. Decreased frequency of extreme weather events

**Answer Key:**

* + 1. 3. Carbon Dioxide
    2. 1. True (This is a point of debate)
    3. 4. Virtually certain
    4. 1. Economic growth
    5. 2. Displacement of coastal populations

**4.32 (Facebook User Base Growth)**

**Problem:**

* Facebook had 1 billion users in October 2012.
* Assume a monthly growth rate of 4%.
* Calculate how many months it takes to reach 1.5 billion and 2 billion users.

**Solution:**

We'll use the compound growth formula:

* **Future Value (FV) = Present Value (PV) \* (1 + r)^n**

Where: \* FV = Future Value (target user base) \* PV = Present Value (initial user base) \* r = Growth rate per period (monthly in this case) \* n = Number of periods (months)

We need to solve for 'n' (number of months).

**1. Growth to 1.5 Billion Users:**

* FV = 1.5 billion
* PV = 1 billion
* r = 4% = 0.04

1.5 = 1 \* (1.04)^n 1.5 = (1.04)^n

To solve for 'n', we can use logarithms:

log(1.5) = log(1.04^n) log(1.5) = n \* log(1.04) n = log(1.5) / log(1.04)

Using a calculator: n ≈ 10.338 months

Since we're dealing with months, we'll round *up* to the nearest whole month.

**It will take approximately 11 months for Facebook to reach 1.5 billion users.**

**2. Growth to 2 Billion Users:**

* FV = 2 billion
* PV = 1 billion
* r = 4% = 0.04

2 = 1 \* (1.04)^n 2 = (1.04)^n

Using logarithms:

log(2) = log(1.04^n) log(2) = n \* log(1.04) n = log(2) / log(1.04)

Using a calculator: n ≈ 17.673 months

Again, we'll round *up* to the nearest whole month.

**It will take approximately 18 months for Facebook to reach 2 billion users.**

**Java Code (to Verify):**

(CODE IS IN NOTEPAD++)