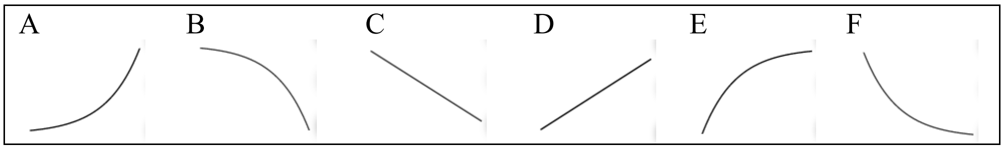
Classifying Parts of Curves

1. Use the graphs A through F and insert the letter choice in the blank.
   Some parts may have more than one answer.



a) Which graphs are increasing? ____________________

b) Which graphs are decreasing? ___________________

c) Which graphs are concave up? ___________________

d) Which graphs are concave down? ___________________

e) Which graphs have **no** concavity? ___________________

f) Which graph could model the following?

In the last quarter of 2009, the economy lost jobs less quickly. ______

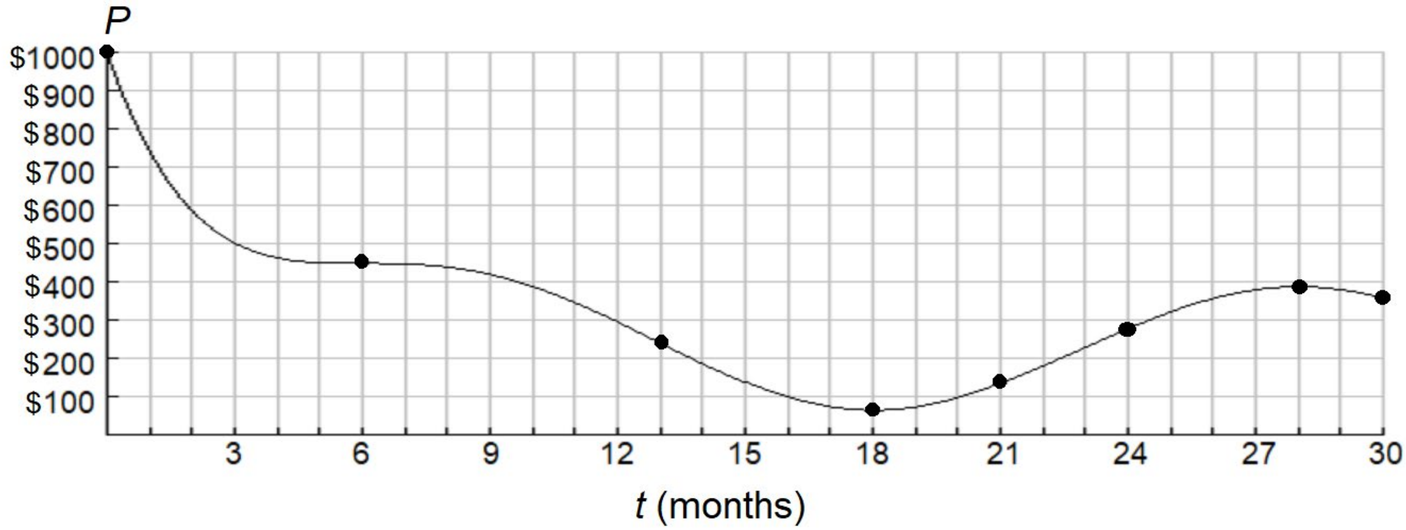
United States economic growth accelerates. ______

The revenue is climbing at a steady rate. ______

Greenland ice loss is accelerating. ______

The rise in the profits is slowing. ______

2. The graph of a company's profit $P(t)$ in dollars at month t is shown.
Report whole numbers in the blanks below.



a) The domain of $P(t)$ is ______ $\leq t \leq$ _____ . In interval notation, this is written _____________.

b) The range of $P(t)$ is _____ $\leq P(t) \leq$ ______ . In interval notation, this is written _____________.

c) Given a function f, we say that $f(c)$ is a **global maximum** or **absolute maximum** of f provided that $f(c) \geq f(x)$ for all x in the whole domain of f.

Given a function f, we say that $f(c)$ is a **global minimum** or **absolute minimum** of f provided that $f(c) \leq f(x)$ for all x in the whole domain of f.

For what value(s) of t does $P(t)$ have the following? If none, state so.

i. an *absolute* maximum? at $t =$ _____

ii. an *absolute* minimum? at $t =$ _____

d) Given a function f, we say that $f(c)$ is a **local maximum** or **relative maximum** of f provided that $f(c) \geq f(x)$ for all x near c.

Given a function f, we say that $f(c)$ is a **local minimum** or **relative minimum** of f provided that $f(c) \leq f(x)$ for all x near c.

For what value(s) of t does $P(t)$ have the following? If none, state so.

i. a *relative* maximum? at $t =$ _____

ii. a *relative* minimum? at $t =$ _____

e) On what open intervals of t is the graph concave up and increasing? ___________________

An *open* interval does **not** include its endpoints.
An interval which **does** include its endpoints is called *closed*, i.e. the answers to parts a and b.

f) For what value(s) of t does the graph change concavity? These are called the **points of inflection**.
Report whole numbers. $t =$ ________________________

g) i. For what value(s) of t does the graph change concavity and is decreasing? $t =$ _______
ii. For what value(s) of t does the graph change concavity and is increasing? $t =$ _______

h) i. On what open intervals of t is the graph concave up? ___________________
ii. On what open intervals of t is the graph concave down? ___________________