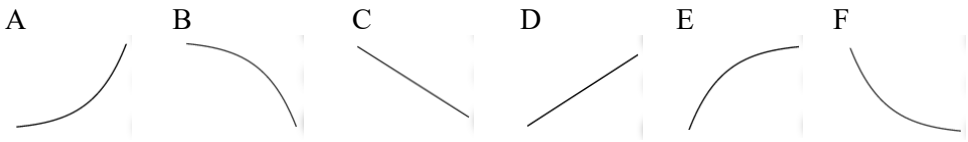
Classifying Parts of Curves

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?

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

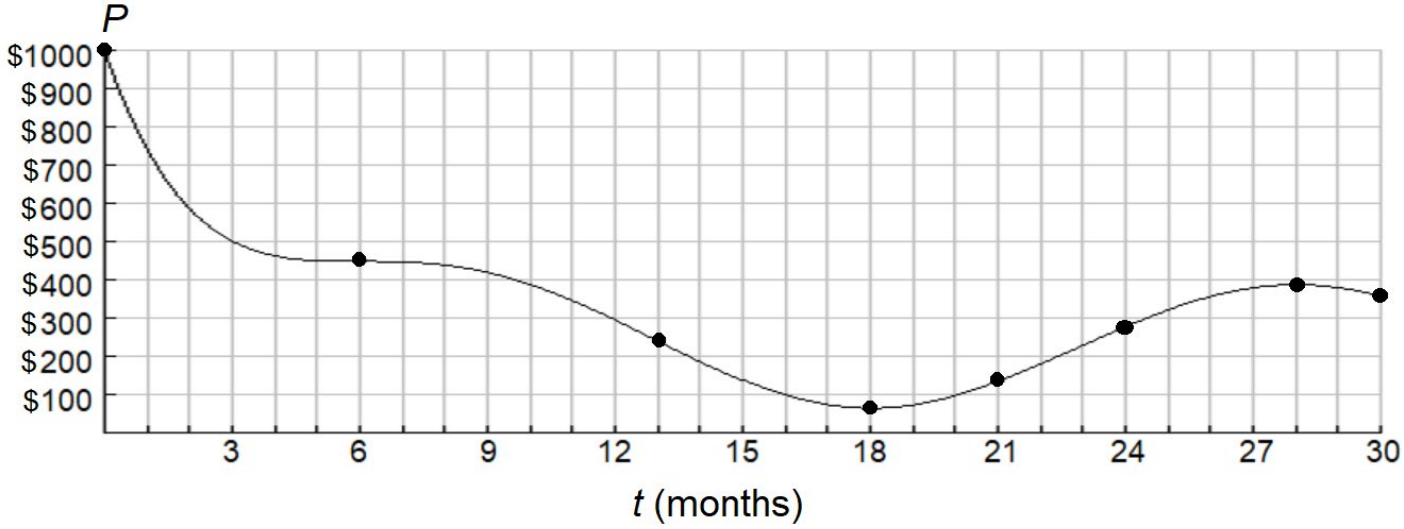
ii. United States economic growth accelerates. _____

iii. The revenue is climbing at a steady rate. _____

iv. Greenland ice loss is accelerating. _____

v. 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 (to the left and right of $x = c$) Exclude endpoints.

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 (to the left and right of $x = c$) Exclude endpoints.

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? _____