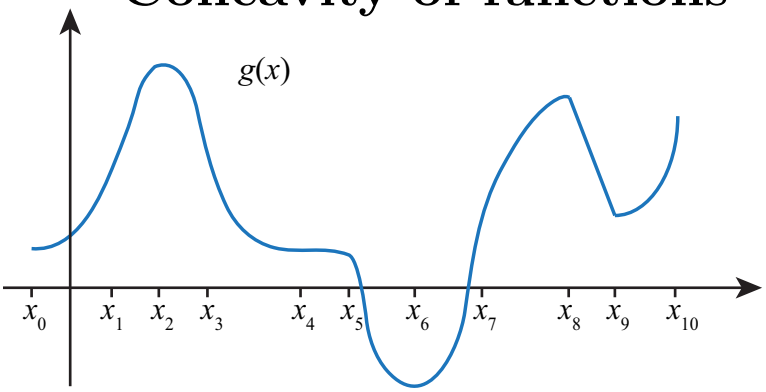
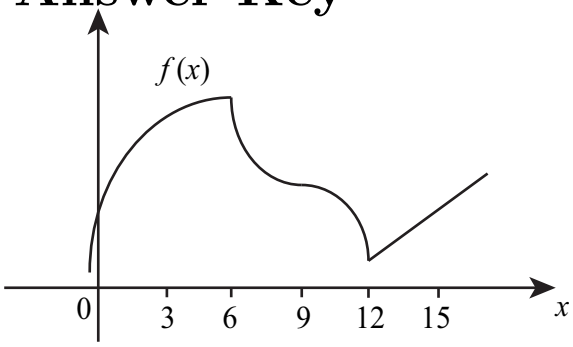
Concavity of functions - Answer Key





1. Find the interval(s) where $g(x)$ is concave up.
   $[x_0, x_1], [x_3, x_4], [x_5, x_7], [x_9, x_{10}]$.

2. Find the interval(s) where $g(x)$ is concave down.
   $[x_0, x_3], [x_7, x_8]$.

3. Find the interval(s) where $g(x)$ is decreasing & concave up.
   $[x_3, x_4], [x_5, x_6]$.

4. Find the interval(s) where $g(x)$ is increasing & concave down.
   $[x_7, x_8]$.

5. Find the interval(s) where $g(x)$ is neither concave up nor down.
   $[x_4, x_5], [x_8, x_9]$.

6. Find the interval(s) where $u(x) = 5x^2 - 6x$ is concave up.
   All real values of x.

7. Find the interval(s) where $v(y) = \ln(y^2)$ is concave up.
   $v(y)$ is always concave down.

8. Find the interval(s) where $f(x) = e^{1-x^2}$ is concave down.
   $\left(-\infty, \frac{1}{\sqrt{2}}\right)$.

9. Find the interval(s) where $h(x) = 6x^3 - 2x^4$ is concave up.
   $(0, 1.5)$.

10. Sketch $f(x)$ satisfying: **(i)** $f''(x) > 0$ for $6 \leq x \leq 9$; $f''(x) < 0$ for $9 \leq x \leq 12$ and $x \leq 3$; $f''(x) = 0$ for $x > 12$.
    (ii) $f'(x) > 0$ for $x \leq 6$ & $x \geq 12$; $f'(x) < 0$ for $6 < x < 12$.

©2012 Shmoop University, Inc. All rights reserved. For classroom use only. Want to print this out for your classroom? Go for it. All other reproduction and distribution is prohibited.

http://www.shmoop.com/calculus/
Shmoop will make you a better lover (of literature, math, life...)