More practice - Chapter 2 (2.6 – 2.8)

Solve the following exercises:

1. Sketch the graph of the following piece-defined functions. Show all work.

$$f(x)=\begin{cases} x+1, & -2\le x<0 \\ \sqrt{x}, & 0\le x\le 1 \\ x^3, & 1<x<2 \end{cases} \qquad f(x)=\begin{cases} 2, & \text{if} \quad x<-3 \\ -2x+1, & \text{if} \quad -3\le x\le 2 \\ x-2, & \text{if} \quad 2<x<6 \end{cases} \qquad f(x)=\begin{cases} x-x^2 & if\ x\le 0 \\ x^2-x & if\ x>0 \end{cases}$$

For each function, find the following:

a) What is the domain and range of each function?

b) Find $f\left(\frac{1}{2}\right)$, $f\left(-\frac{1}{2}\right)$, and $f\left(\frac{3}{2}\right)$.

d) On what intervals is the function increasing ,decreasing, constant ?

e) Calculate $f\left(f(1)\right)$, $(f\circ f)(-1)$, and $(f\circ f)(0)$.

2. Let $p(x)=2x+1$ and $q(x)=x^2-3$ two functions.

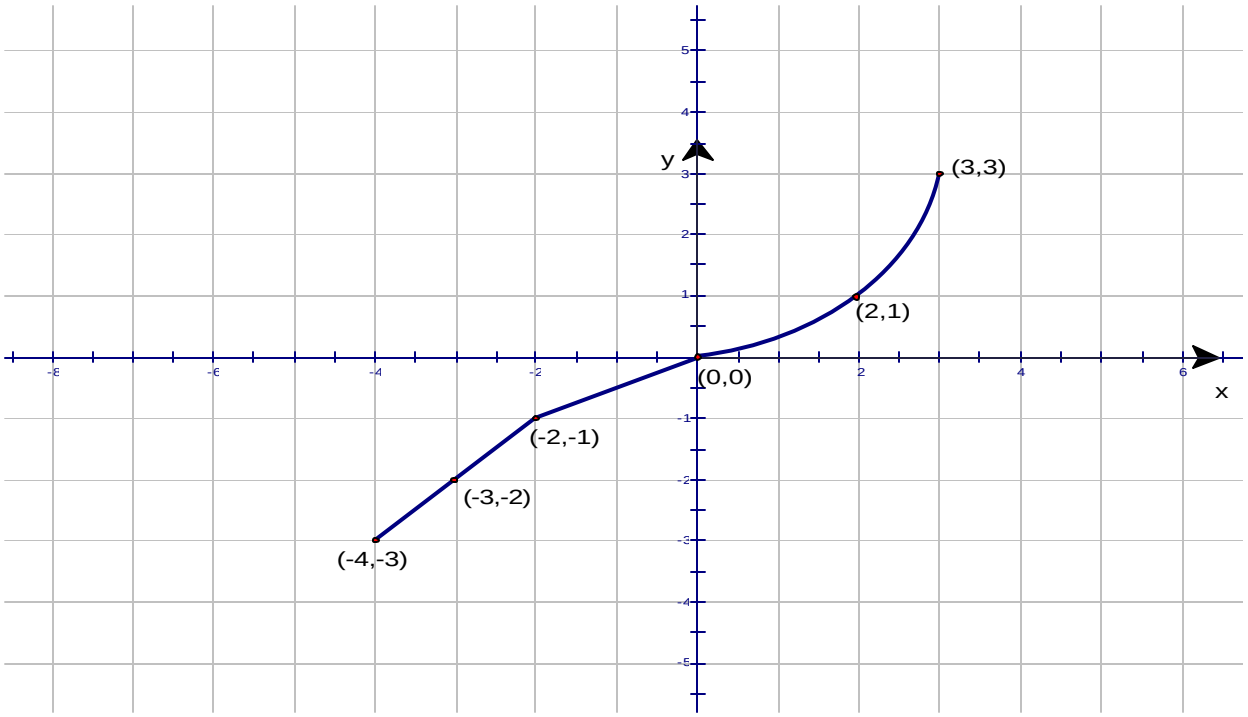
a) graph both functions in the same coordinate plane.

b) Find a formula in terms of *x* for $(p\circ q)(x)$ and its domain.

c) Find $p\left(q(-2)\right)$.

d) Find and simplify $\frac{p(x+h)-p(x)}{h}$ and $\frac{q(x+h)-q(x)}{h}$.

3.



Using the graph $y = f(x)$ shown, answer the following:

a) Is *y* a function of *x*? Explain.

b) Find the domain and range of *f*.

c) List the intercepts (as ordered pairs).

d) Find $f(-2)$.

e) For what values of *x* does $f(x) = -3$?

f) Solve $f(x) > 0$.

g) Find $(f \circ f)(-3)$

h) Graph $y = f(x-2)$

i) Graph $y = f(x) - 2$

j) Graph $y = f(-x)$

k) If *f* even, odd , or neither?