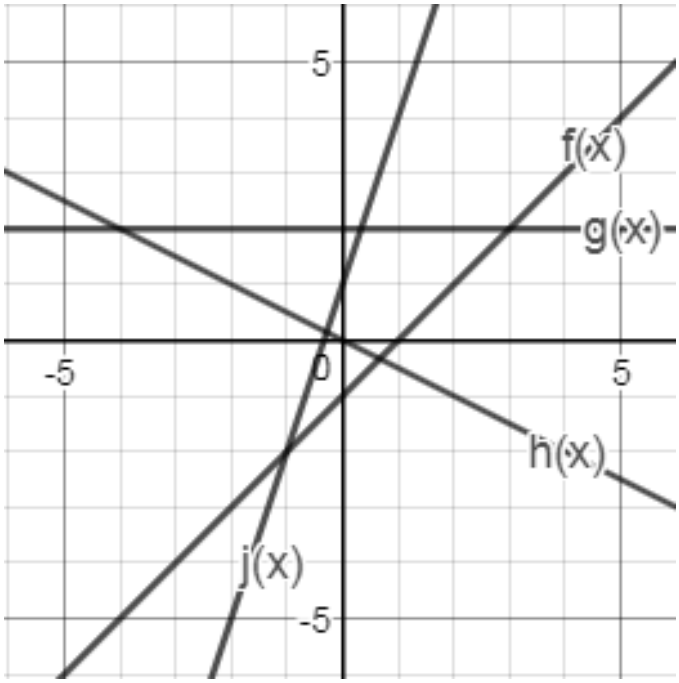
MATH 1300
Precalculus Review

Warm-up Problem A. Consider the following graph of linear functions:



(a) Which function(s) has/have a negative slope?

(b) Which function(s) has/have the highest magnitude slope?

(c) Which function(s) has/have a slope of zero?

(d) Which function(s) has/have the greatest vertical intercept?

(e) Which function(s) has/have the smallest vertical intercept?

Problem 1. For each of the following situations, find *and interpret* the slope and vertical intercept.

a) An icicle grows according to the formula $W(t) = 0.2t + 0.15$, where t is the time in hours since the first measurement was taken, and $W(t)$ is the width of the icicle in centimeters.

b) For an international travel data plan, a cell provider charges its customers according to the formula $C(n) = 10 + 2.05n$, where n is the number of megabytes (MB) of international data used, and $C(n)$ is the total charge in dollars for one month of international service.

Problem 2. Let a and b be positive numbers. Match each equation to its possible graph below.

(a) $y = \frac{a}{2}x$

(b) $y = ax + b$

(c) $y = -bx - a$

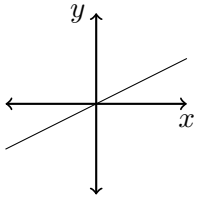
(d) $x = 2b$

(e) $y = -bx + a$

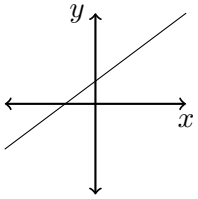
(f) $y = ax - b$

(g) $y = a + b$

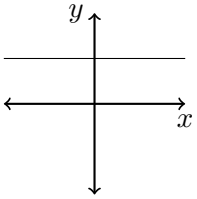
(i)



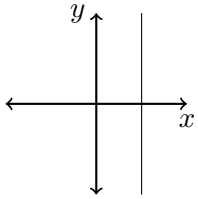
(ii)



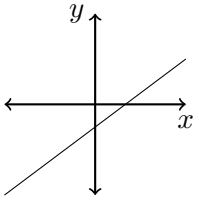
(iii)



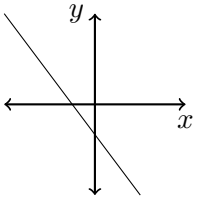
(iv)



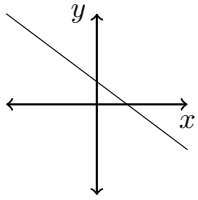
(v)



(vi)



(vii)



Problem 3. This problem is involved, but important! If $f(x) = 2x^2 - 5x + 1$ and $h \neq 0$, evaluate $\dfrac{f(a+h) - f(a)}{h}$

Problem 4. For each function description below, represent the function as asked.

(a) The function $f(x)$ takes a number x, adds 2 to it, then divides the result by 5. Represent this function algebraically (symbolically).

(b) The function g maps the set {cat, dog, bear, kangaroo, koala} to the letters $\{a, b, c, d, e, f, g, h, i, j, k\}$. The rule is that an animal gets mapped to the letter that its name starts with. Represent this function as a table.

Problem 5. If in problem 4 part (b), we asked for the map to map the set of letters into the set of animals by the rule a letter gets mapped to the animal(s) that start with that letter. Is our map still a function? For what reason(s)?

Problem 6. Evaluate the following:

(a) $\sin(\pi/4)$

(b) $\cos(\pi/3)$

(c) $\tan(\pi/6)$

(d) $\sec(\pi/4)$

(e) $\csc(\pi/6)$

(f) $\sin^{-1}(\sqrt{3}/2)$

(g) $\sin^{-1}(-\sqrt{3}/2)$

(h) $\tan^{-1}(1)$

(i) $\tan^{-1}(\sqrt{3})$