1. You pull out the plug from the bathtub. After 40 seconds, there are 13 gallons of water left in the tub. One minute after you pull the plug, there are 10 gallons left. Assume that the number of gallons varies linearly with the time since the plug was pulled. (40, 13) (60, 10)

a. Write the particular equation expressing the number of gallons (g) left in the tub in terms of the number of seconds (s) since you pulled the plug.

$g = ms + b$

$10 = -\frac{3}{20}(60) + b$

$b = 19$

$m = -3/20$

$g = -\frac{3}{20}s + 19$

b. How many gallons would be left after 20 seconds? 50 seconds?

$g = -\frac{3}{20}(20) + 19 = 16g$

$g = -\frac{3}{20}(50) + 19 = 11.5g$

c. At what time will there be 7 gallons left in the tub?

$7 = -\frac{3}{20}s + 19$

$s = 80s$

d. Find the y-intercept (gallon-intercept). What does this number represent in the real world? 19

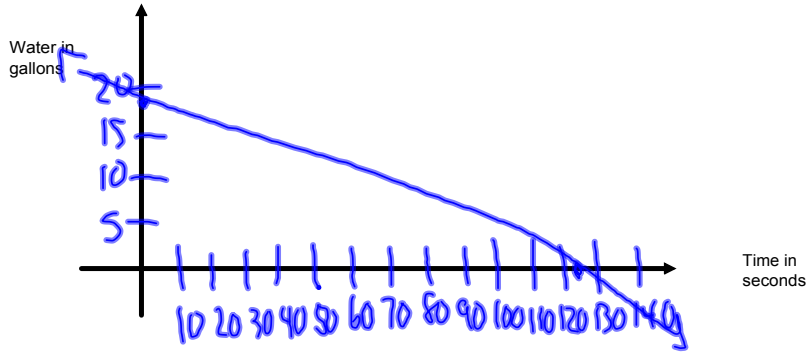
19 gallons in tub before you start to drain

e. Find the x-intercept (time-intercept). What does this number represent in the real world?

$0 = -\frac{3}{20}x + 19$

$x = 126.\overline{6}$ after 126.6s there is no water left in the tub

f. Plot the graph of this linear function. Use a suitable domain.



g. What is the slope? What does this number represent?

$-\frac{3}{20}$ $\frac{g}{s}$ 3/20 of a gallon goes down the drain every second