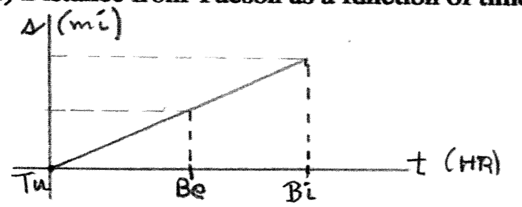
1.1 FUNCTION PRACTICE CN

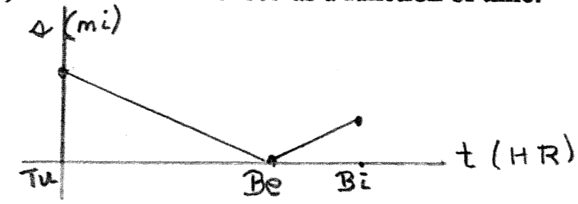
Bridges Math 122A **LINEAR FUNCTIONS [1.1]** Name Key

1. As you travel at a constant speed from Tucson to Bisbee, you pass through Benson. Sketch possible graphs to represent the functions below. **LABEL THE AXES AND IMPORTANT FEATURES OF YOUR GRAPHS.**

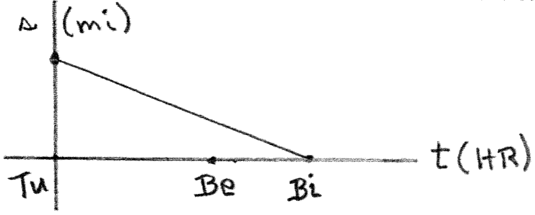
(a) Distance from Tucson as a function of time:



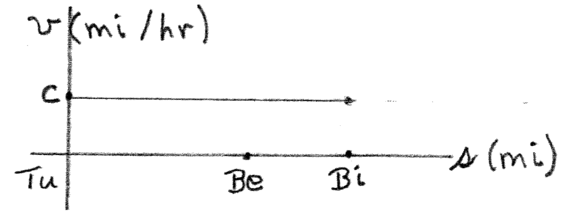
(c) Distance from Benson as a function of time:



(b) Distance from Bisbee as a function of time:



(d) Speed as a function of distance:



2. Use the graph at the right to answer the following — the domain is [-3,11].

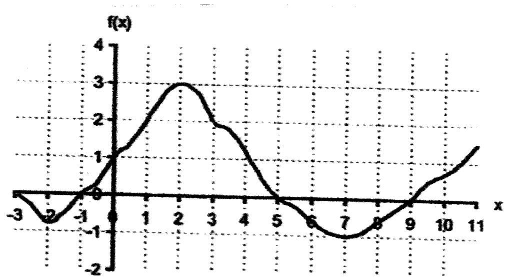
(a) What is the value of $f(0)$? $f(0) = 1$

(b) What is the range of $f(x)$? $[-1, 3]$

(c) What is(are) the zeros of $f(x)$? $\{-3, -1, 5, 9\}$

(d) On what interval(s) is $f(x)$ increasing? $(-2, 2) \cup (7, 11)$

(e) Find the value(s) of x so that $f(x) = 2$? $x = 1,\ x = 3$



3. The relationship between the tuition, T, and the number of credits, c, at a particular college is given by

$$T(c) = \begin{cases} 100 + 220c & 0 \le c \le 6 \\ 800 + 220(c-6) & 6 < c \le 18 \end{cases}$$

SHOW WORK OR GIVE AN EXPLANATION FOR EACH ANSWER.

(a) What is the tuition for 7 credits?

$T(7) = 800 + 220(7-6) = \$1020$

(b) If the tuition was $3000, how many credits were taken?

$3000 = 800 + 220(c-6)$ $\quad 10 = c - 6$

$2200 = 220(c-6)$ $\quad c = 16$ CREDITS

(c) In a complete sentence, give a practical interpretation of the vertical intercept.

LET $x = 0$ THE BASE COST FOR APPLYING

$T(0) = \$100$ IS $100.

(d) In a complete sentence, give a practical interpretation of the slope.

$m = 220$

THE COST FOR EACH CREDIT IS $220.

4. Solve $g(y) = 5$ for $g(y) = \sqrt{y^2 - 16^2}$. **SHOW ALL WORK,** GIVE EXACT ANSWER(S).

$\sqrt{y^2 - 16^2} = 5$

$y^2 - 16^2 = 5^2$

$y^2 = 25 + 256$

$y^2 = 281$

$y = \pm\sqrt{281}$

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5. Let $H(\alpha) = H_0(1 - \alpha \cdot \Delta t)$. The constants are positive. $H(\alpha) = H_0 - H_0 \alpha \Delta t$

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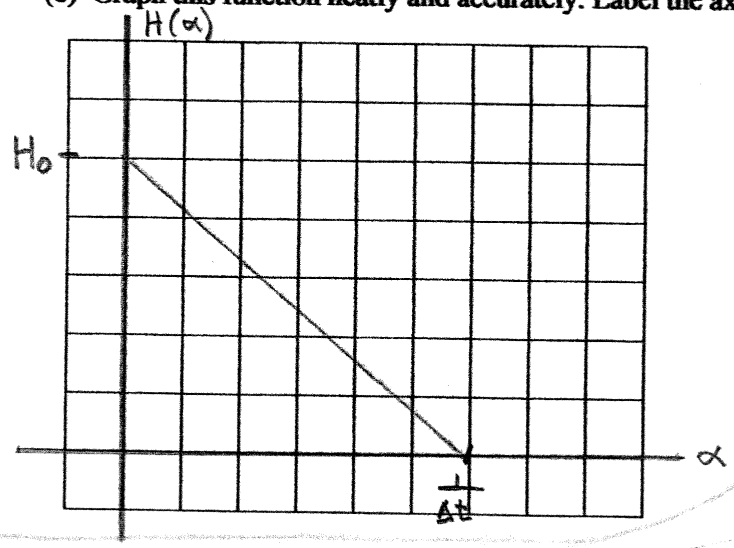
(a) What is the independent variable? α

(b) What is the dependent variable? $H(\alpha)$

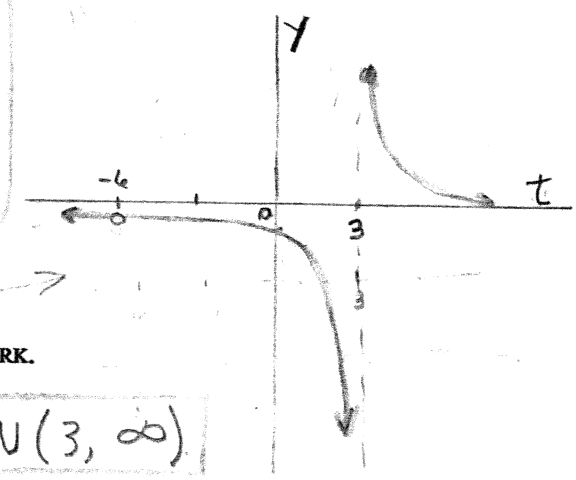
(c) What are the constants? $H_0, -\Delta t H_0$

(d) Re-write the given equation so that it is in the form $y = mx + b$. $H(\alpha) = -H_0 \Delta t \alpha + H_0$

(e) Graph this function neatly and accurately. Label the axes and the intercepts clearly.



$$H(\alpha) = -\frac{H_0}{\frac{1}{\Delta t}}\alpha + H_0$$



6. (a) Find the domain of $f(t) = \frac{t+6}{t^2+3t-18}$ SHOW ALL WORK.

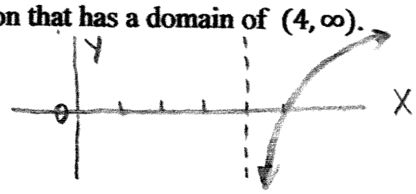
$$f(t) = \frac{t+6}{(t-3)(t+6)}$$

D: $(-\infty, -6) \cup (-6, 3) \cup (3, \infty)$

$t^2 + 3t - 9$

(b) Create a function that has a domain of $(4, \infty)$.

$Y = \ln(x - 4)$



7. Gasoline is being pumped into a tank at a constant rate (cubic feet per minute). A graph of the height of the gasoline in the tank as a function of time is shown. You can assume that the tank was initially empty and that the tank will be filled. Draw a possible shape of the tank. Label your graph.

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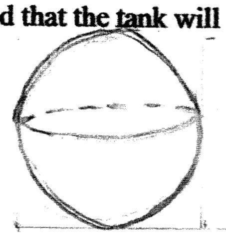

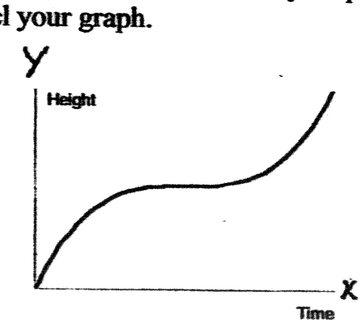

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