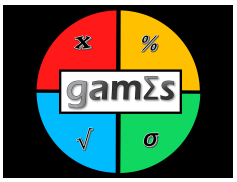
GAMES Practice Problems – Graphs and the Euclidean Plane



1. A ride costs 3.00 for the first half kilometer and 0.35 for an additional half-kilometer. Find a linear function which models the cost of a ride F as a function of kilometers driven, m.

2. For the equation, $y = 0.5x$, find the y-coordinate for each value of x :

x	-3	-2	-1	0	1	2	3
y							

3. Decide whether the following tables have linear or non-linear data.

(a)

x	-1	0	1	2	3
y	4	1	-2	-5	-8

(b)

x	-4	-3	-2	-1	0
y	18	11	6	3	2

(c)

x	1	2	3	4	5
y	-3	-5	-7	-9	-11

4. A line's function is given as $f(x) = -0.9x - 17.5$. What is the line's y-intercept and x-intercept?

5. Find the x-intercept and y-intercept of the line: $-4x + 12y = 15$

6. Are the following expressions linear or not?

   (a) $\frac{3a+1}{4}$

   (b) $5^x + 1$

   (c) $5t - 8$

   (d) $4^2 + \frac{x}{3}$

   (e) $6r + r - 1$

   (f) $\frac{3a+1}{a}$

7. The equation $y = 3x + 6$ estimates US households with internet service, where x represents years since 2001. In what years wil there be at least 24 million homes with internet? Write your answer as an inequality involving x.

8. Jimmy Nixon has scores of 65, 88, and 91 in his tests. Use an algebraic expression with an inequality to the score he needs for a 70 percent or higher. The final is out of 300 points.

9. The number x of game systems sold in a week is related to its price p. 40 game systems were sold at a price of \$120. When the system went on sale the following week, 100 systems were sold at \$75 a piece.

   (a) Find a linear function which fits this data. Use the weekly sales x as the independent variable and the price p as the dependent variable.

   (b) Find a suitable applied domain.

   (c) If the retailer wants to sell 160 systems, what should the price be?

10. A car rental business charges \$11 for the first hour and \$7.00 for each additional hour. How long could you rent with just \$95.

11. The average life expectancy of a human born in 1900 was 55 years. Life expectancy has increased by about 0.2 year for each birth year after 1900. Assuming the trend continues, for which birth year will the average life expectancy be 71 years?

12. Phone companies offer the following plans:

    - Beta firm charges \$0.3 dollars per minute (no fixed monthly charge).
    - Delta firm charges \$14.1 per month plus \$0.28 per minute.
    - Omega Firm charges a fixed rate of \$50 per month.

    Let $A(x), B(x)$, and $C(x)$ represent monthly charges from Beta firm, Delta firm, and Omega Firm respectively for x minutes on calls.

    (a) Find an expression for the monthly cost of using Beta firm, $A(x)$.

    (b) Find an expression for the monthly cost of using Delta firm, $B(x)$.

    (c) Find an expression for the monthly cost of using Omega Firm, $C(x)$.

    (d) If you spend 125 minutes in a month, which company is cheapest?

    (e) Draw the graphs for $A(x)$, $B(x)$ and $C(x)$.

    (f) When is using Omega Firm the cheapest.