1. The Recording Industry Association of America reports\(^1\) the percent of music purchases in each of the six current best-selling categories, by year, as follows:

Music Purchases

Use the graph to answer, as accurately as possible, these questions:

a. What is the output for the Rock graph?  
   \((\text{what is the output label?})\)  
   \(\text{Music Purchases}\)  
   How is this output measured \((\text{what are the output units?})\) \(\% \text{ or percentage points}\)

b. What is the input for the Pop graph? \(\text{years after 1900}\)

c. Which type of music was rock's closest competitor music in 1998? \(\text{country}\)

d. Describe the trend in gospel music record sales over the past 10 years.  
   \(\text{The gospel music record sales were fairly constant until 1995 and then increased slightly until 1998.}\)

e. Estimate the percent of record sales accounted for in 1992 by music types other than those six types shown on the graph.  
   \(\text{about 4\%}\)

\[5 + 11 + 12 + 14 + 20 + 34 = 96\%\]

f. If $14 billion was spent in 1998 on music purchases, estimate the amount spent in 1998 on

   a. country music records \(\sim 16\% (14) \rightarrow $2.24 \text{ billion}\)
   
   b. rap \(\sim 12\% (14) \rightarrow $1.68 \text{ billion}\)
   
   c. rhythm and blues \(\sim 14\% (14) \rightarrow $1.96 \text{ billion}\)

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\(^1\) As reported in \textit{USA TODAY}, page 3\textit{E}, April 23, 1999.
2. The Band Club and Speech Club at a high school are raising funds for a school trip. The graph shows the number of magazine subscriptions each club sold during the spring term.

a. The description of the output is **the number of magazine subscriptions sold**.

b. The output units are **the number of magazine subscriptions sold**

c. The description of the input is **the month**.

d. When did the two clubs sell the same number of subscriptions? **March**

   How many subscriptions did each club sell at that time? **80 subscriptions**

e. In **April** and **May**, the Speech Club sold more subscriptions than the Band Club.

f. How many more subscriptions were sold by the Band Club than the Speech Club in February? **70 subs**
3. A wholesale clothing supplier charges a $45 shipping fee and $15 per sweatshirt for orders between 1 and 10 sweatshirts.

a. A retailer will have to pay $195 to order 10 sweatshirts.

\[ 45 + 15(10) = 195 \]

b. Find a model for the cost to order \( x \) sweatshirts, for \( 1 \leq x \leq 10 \). Define the model completely.

\[ C(x) = 45 + 15x \text{ dollars gives the cost to order } x \text{ sweatshirts, } 1 \leq x \leq 10. \]

c. The average cost per sweatshirt when 10 sweatshirts are ordered is $19.50 per sweatshirt

\[ \frac{195}{10 \text{ sweatshirts}} = \$19.50 \text{ per sweatshirt} \]

d. The equation for the average cost per sweatshirt when \( x \) sweatshirts are ordered, for \( 1 \leq x \leq 10 \) is

\[ \frac{C(x)}{x} \text{ or } A(x) = \frac{45 + 15x}{x} \text{ or } A(x) = \frac{45}{x} + 15. \]

e. The retailer adds 200% of the average cost per sweatshirt as a markup when setting the selling price of the sweatshirt. When 10 sweatshirts are ordered, he will price the sweatshirts at $58.50 each.

\[ \text{cost + markup} = 19.50 + 2(19.50) = 58.50 \]

f. The number of sweatshirts that must be sold to recoup the cost of ordering 10 sweatshirts is 4.

\[ \text{Setup and solve the equation } 58.50n = 195 \rightarrow n = 3.333; \text{ Because we can't sell a fraction of a sweatshirt, the answer must be rounded up to } 4. \]
4. Calculator Practice:

a. Evaluate \( f(x) = \frac{16 - 5x - x^2}{x} \), \( x = 10.2, \ x = -\frac{3}{4} \). Round your answers to 3 decimal places.

\[
\begin{array}{c|c}
\text{Plot} & \text{Plot}2 \text{ Plot}3 \\
\text{Y1} & (10.2) \\
& -13.63137255 \\
\text{Y1} & (-3/4) \\
& -25.58333333
\end{array}
\]

\( f(10.2) \approx -13.631 \)

\( f(-3/4) \approx -25.583 \)

b. Find the input value(s) of the function corresponding to each output given. Give your answers correct to the nearest 3 decimal places. Graph the function on the axes provided.

\( f(x) = \frac{16 - 5x - x^2}{x}, \ f(x) = 5 \)

Using the solver (MATH 0):

\[
\begin{array}{c}
\text{V1}=5=0 \\
\text{x}=11 \\
bound=\{ -1e99, 1 \ldots \\
left=rt=0
\end{array}
\]

Answers: \( f(x) = 5 \) when \( x \approx 1.403 \) and when \( x \approx -11.403 \).

c. Evaluate \( g(t) = 1.6e^t - 6\ln t - \sqrt{2t}, \ t = 16, \ t = \frac{44}{3} \). Round your answers to 3 decimal places.

\[
\begin{array}{c|c}
\text{Plot} & \text{Plot}2 \text{ Plot}3 \\
\text{Y1} & (16) \\
& 14217754.54 \\
\text{V1} & (44/3) \\
& 3747743.754
\end{array}
\]

\( g(16) = 14217754.54 \)

\( g(44/3) = 3747743.754 \)
d. Find the input value(s) of the function corresponding to each output given. Give your answers correct to the nearest 3 decimal places. Graph the function on the axes provided.

\[ g(t) = 1.6e^t - 6\ln t - \sqrt{2t}, \quad g(t) = 10 \]

Using \(2^{nd} \rightarrow \text{TRACE} \rightarrow \text{INTERSECT}\)

Answers: \( g(t) = 10 \) when \( t \approx 0.236 \) and when \( t \approx 2.387 \).