fx-CG50 - Example Questions - Tips and Tricks

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Run-Matrix [1]

1. Solve the equation $2\sin\left(2x+\frac{\pi}{6}\right)=1, 0\le x\le 2\pi$.
2. Determine where the gradient of $y=\frac{1}{x}+x^2$ is -3.
3. Determine the median of the distribution with probability density function $f(x)=0.2e^{-0.2x}$.
4. The amount of water in bottles is normally distributed with a mean of μ and standard deviation of 12 mL.
(i) If $\mu=620$, what percentage of bottles will contain less than the stated contents of 600 mL?
(ii) If the probability of a randomly selected bottle containing less than 600 mL of water is 1%, determine μ.

eActivity [3]

1. Determine the angle subtended at the centre by a segment of area 10 cm^2 in a circle of radius 12 cm.
2. Calculate $\mathrm{E}(X)$ and $\mathrm{Var}(X)$ for the following discrete distribution.

x	1	2	4
$P(X=x)$	0.4	0.1	0.5

Graph [5]

1. Sketch the graph of $y=x^3-3x^2, -2\le x\le 4$ and determine the equation of the tangent where $x=3$.
2. Graph the probability density function $f(x)=\begin{cases}\frac{x}{2}-\frac{1}{2} & 1\le x\le 2\\ \frac{5}{6}-\frac{x}{6} & 2<x\le 5\\ 0 & \text{elsewhere}\end{cases}$

Table [7]

1. Investigate $\lim_{x\to 0}\frac{\sin x}{x}$.
2. Create a table of probabilities for the random variable X, where $X\sim B(3, 0.4)$.

Statistics [2]

Example: Determine the coefficient of determination between x and y and use the linear regression line y on x to predict y when (i) $\mathrm{x}=40$ (ii) $\mathrm{x}=70$ using the data below.

x	29	35	47	50	59
y	51	69	83	98	121

Program [B]

1. Find the largest angle and area of a triangle with sides 25 cm, 20 cm and included angle of 55°.
2. Is 251 a prime number?
3. Determine the angle between the vectors $(2,-3,5)$ and $(-1,2,4)$ and their cross product.

Equation [A]

1. If $A=500(0.95)^n$, determine (i) A when $n=12$ and (ii) n when $A=100$.

Recursion [8]

1. A population can be modelled by $P_{n+1}=0.85P_n+30, P_0=20$. Determine P_{12} and long-term population.

Financial [C]

1. Interest on a loan at 9.6% per annum is compounded monthly. Determine the effective interest rate.
2. Calculate the future value of $2000 invested at 5.4% pa compounded quarterly over 5 years.
3. What is monthly repayment on loan of $15 000 over 3 years at 9.6% pa and how much interest accumulates?

