

Part II

Answer all 8 questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

25 Given that $f(x) = 2x + 1$, find $g(x)$ if $g(x) = 2[f(x)]^2 - 1$.

$$g(x) = 2(2x + 1)^2 - 1$$

↓

$$g(x) = 2(2x + 1)(2x + 1) - 1$$

$$g(x) = 2(4x^2 + 4x + 1) - 1$$

$$g(x) = 8x^2 + 8x + 2 - 1$$

$$g(x) = 8x^2 + 8x + 1$$

	$2x + 1$	
$2x$	$4x^2$	$2x$
$+1$	$2x$	1
	$4x^2 + 4x + 1$	

26 Determine if the product of $3\sqrt{2}$ and $8\sqrt{18}$ is rational or irrational. Explain your answer.

multiply!

$$(3\sqrt{2})(8\sqrt{18})$$

$$24\sqrt{36}$$

$$24(6) = 144$$

The product is rational because it is a whole number (144).

Part III

Answer all 4 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

33 The height, H , in feet, of an object dropped from the top of a building after t seconds is given by $H(t) = -16t^2 + 144$.

$x=1$ $x=2$

How many feet did the object fall between one and two seconds after it was dropped?

$y = -16x^2 + 144$

x	y
0	144
1	128
2	80
3	0

$\begin{array}{r} 128 \\ -80 \\ \hline 48 \end{array}$

Between 1 and 2 seconds, the object dropped 48 feet.

Determine, algebraically, how many seconds it will take for the object to reach the ground.

~~$y = -16x^2 + 144$~~

$H(t) = -16t^2 + 144$

$0 = -16t^2 + 144$

$-144 = -16t^2$

$-144 = -16t^2$

$\sqrt{9} = \sqrt{t^2}$

$3 = t$

At 3 seconds, the object will reach the ground.