

Name: _____

Date: _____

Regents Review Day 6: Functions

1. Which representations are functions? *V-line*

2 = 6
2 = -6

x	y
2	6
3	-12
4	7
5	5
2	-6

Not a function

III *No*
2 pts

IV $y = 2x + 1$

II $(1,1), (2,1), (3,2), (4,3), (5,5), (6,8), (7,13)$

(1) I and II
(2) II and I
(3) III, only
(4) IV, only

yes V-line

2. Lynn, Jude, and Anne were given the function $f(x) = -2x^2 + 32$, and they were asked to find $f(3)$. Lynn's answer was 14, Jude's answer was 4, and Anne's answer was ± 4 . Who is correct?

1) Lynn, only
2) Jude, only
3) Anne, only
4) Both Lynn and Jude

$-2(3)^2 + 32$

3. An online company lets you download songs for \$0.99 each after you have paid a \$5 membership fee. Which domain would be most appropriate to calculate the cost to download songs?

D → x
R → y

1) rational numbers greater than zero
2) whole numbers greater than or equal to one ✓
3) integers less than or equal to zero
4) whole numbers less than or equal to one

$y = .99x + 5$

4. The range of the function $f(x) = x^2 + 2x - 8$ is all real numbers

1) less than or equal to -9
2) greater than or equal to -9
3) less than or equal to -1
4) greater than or equal to -1

5. Rachel and Marc were given the information shown below about the bacteria growing in a Petri dish in their biology class.

Number of Hours, x	1	2	3	4	5	6	7	8	9	10
Number of Bacteria, B(x)	220	280	350	440	550	690	860	1070	1340	1680

Rachel wants to model this information with a linear function. Marc wants to use an exponential function. Which model is the better choice? Explain why you chose this model.

Marc.

+60

This scenario does not inc. at a CONSTANT rate.

x	y
0	2
1	4
2	6
3	8
4	10

Handwritten annotations showing a constant difference of +2 between consecutive y-values:

- From 2 to 4: $+2$
- From 4 to 6: $+2$
- From 6 to 8: $+2$
- From 8 to 10: $+2$

6. The highest possible grade for a book report is 100. The teacher deducts 10 points for each day the report is late. Which kind of function describes this situation?
 1) linear
 2) quadratic
 3) exponential growth
 4) exponential decay
7. As x increases beyond 25, which function will have the largest value?
 1) $f(x) = 1.5^x$
 2) $g(x) = 1.5x + 3$
 3) $h(x) = 1.5x^2$
 4) $k(x) = 1.5x^3 + 1.5x^2$

Handwritten calculations for question 7:

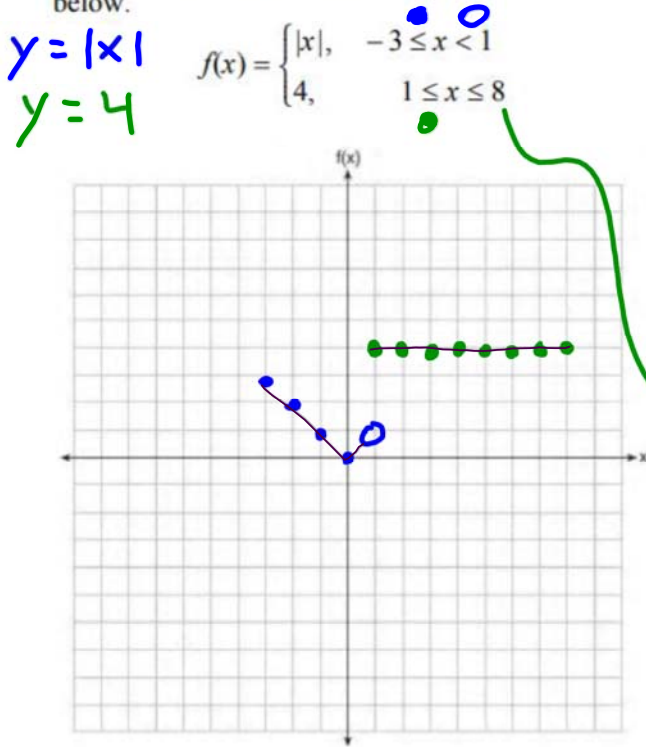
$$1.5^{26} =$$

$$1.5(26) + 3 =$$

$$1.5(26)^2 =$$

$$1.5(26)^3 + 1.5(26)^2 =$$

8. Graph the following function on the set of axes below.



X	Y1			
-7	7			
-6	6			
-5	5			
-4	4			
-3	3			
-2	2			
-1	1			
0	0			
1	1			
2	2			
3	3			

X = -7

x	y
1	4
2	4
3	4
4	4

9. Given the following quadratic functions:

$g(x) = -x^2 - x + 6$

and

x	-3	-2	-1	0	1	2	3	4	5
n(x)	-7	0	5	8	9	8	5	0	-7

Handwritten calculation: $\frac{\Delta y}{\Delta x} = \frac{9-5}{1+1} = \frac{4}{2} = 2$

- Which statement about these functions is true?
- Over the interval $-1 \leq x \leq 1$, the average rate of change for $n(x)$ is less than that for $g(x)$.
 - The y -intercept of $g(x)$ is greater than the y -intercept for $n(x)$.
 - The function $g(x)$ has a greater maximum value than $n(x)$.
 - The sum of the roots of $n(x) = 0$ is greater than the sum of the roots of $g(x) = 0$.

Handwritten calculations for question 9:

$$(-1, 6) \quad 6-4$$

$$(1, 4) \quad -1-1$$

Homework/Practice Questions

<p>1. Which table represents a function?</p> <p>1) <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"><tr><td>x</td><td>2</td><td>4</td><td>2</td><td>4</td></tr><tr><td>f(x)</td><td>3</td><td>5</td><td>7</td><td>9</td></tr></table></p> <p>2) <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"><tr><td>x</td><td>0</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>f(x)</td><td>0</td><td>1</td><td>-1</td><td>0</td></tr></table></p> <p>3) <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"><tr><td>x</td><td>3</td><td>5</td><td>7</td><td>9</td></tr><tr><td>f(x)</td><td>2</td><td>4</td><td>2</td><td>4</td></tr></table></p> <p>4) <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"><tr><td>x</td><td>0</td><td>1</td><td>-1</td><td>0</td></tr><tr><td>f(x)</td><td>0</td><td>-1</td><td>0</td><td>1</td></tr></table></p>	x	2	4	2	4	f(x)	3	5	7	9	x	0	-1	0	1	f(x)	0	1	-1	0	x	3	5	7	9	f(x)	2	4	2	4	x	0	1	-1	0	f(x)	0	-1	0	1	<p>2. If $f(x) = \frac{1}{2}x^2 - \left(\frac{1}{4}x + 3\right)$, what is the value of $f(8)$?</p> <p>1) 11 2) 17 3) 27 4) 33</p>
x	2	4	2	4																																					
f(x)	3	5	7	9																																					
x	0	-1	0	1																																					
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x	0	1	-1	0																																					
f(x)	0	-1	0	1																																					
<p>3. Let f be the function represented by the graph below.</p> <p style="text-align: center;">Let g be a function such that $g(x) = -\frac{1}{2}x^2 + 4x + 3$.</p> <p>Determine which function has the larger maximum value. Justify your answer.</p>	<p>4. Vinny collects population data, $P(h)$, about a specific strain of bacteria over time in hours, h, as shown in the graph below.</p> <p>Which equation represents the graph of $P(h)$?</p> <p>1) $P(h) = 4(2)^h$ 2) $P(h) = \frac{46}{5}h + \frac{6}{5}$ 3) $P(h) = 3h^2 + 0.2h + 4.2$ 4) $P(h) = \frac{2}{3}h^3 - h^2 + 3h + 4$</p>																																								

5. The tables below show the values of four different functions for given values of x .

x	f(x)	x	g(x)	x	h(x)	x	k(x)
1	12	1	-1	1	9	1	-2
2	19	2	1	2	12	2	4
3	26	3	5	3	17	3	14
4	33	4	13	4	24	4	28

Which table represents a linear function?

- | | |
|-----------|-----------|
| 1) $f(x)$ | 3) $h(x)$ |
| 2) $g(x)$ | 4) $k(x)$ |