

1.  $f(x) = 2x^2 - 3$  from  $[2, 4]$ .  $f(2) = 2(2)^2 - 3 = 5$   
 $f(4) = 2(4)^2 - 3 = 29$   
 $\frac{29-5}{4-2} = \frac{24}{2} = 12$

2.  $f(x) = -x^2 - 7x + 1$  from  $[-1, 3]$ .

3. a. Find the rate of change from day 2 to 5.

121-30  
5-2

| DAYS (X) | AMOUNT OF BACTERIA F(X) |
|----------|-------------------------|
| 1        | 19                      |
| 2        | 30                      |
| 3        | 48                      |
| 4        | 76                      |
| 5        | 121                     |
| 6        | 192                     |

4. In 2008, about 66 million U.S. households had both landline phones & cell phones. Find the rate of change from 2008 - 2011.

| YEAR (X) | HOUSEHOLDS IN MILLIONS F(X) |
|----------|-----------------------------|
| 2008     | 66                          |
| 2009     | 61                          |
| 2010     | 56                          |
| 2011     | 51                          |

What does this mean?

5. Find the average rate of change from  $[0, 2]$

$\frac{-9 - (-5)}{2 - 0} = \frac{-4}{2} = -2$

6. Find the average rate of change from  $[4, 5]$

7. Find the rate of change of Pete's height from 3 to 5 years.

|              |    |    |    |    |    |    |
|--------------|----|----|----|----|----|----|
| Time (years) | 1  | 2  | 3  | 4  | 5  | 6  |
| Height(in.)  | 27 | 35 | 37 | 42 | 45 | 49 |

$\frac{45-37}{5-3} = \frac{8}{2} = 4$

8. For  $f(x) = x^2 + 4x + 1$ , find the rate of change on the interval  $[-2, 4]$ .