Name: a = y-intercept Hour: Date:

b = y_2/y_1

Part B: Exponential Equation from Two Data Points

Directions: Write exponential equations for each pair of points. (Hint: label x1, y1, x2, y2)

1. (0, 6), (1, 15) — x_1, y_1, x_2, y_2; $a = 6$; $b = \frac{15}{6} = 2.5$ → $y = 6(2.5)^x$
2. (1, 55), (0, 5) — x_2, y_2, x_1, y_1; lower x is x_1; $a = 5$; $b = \frac{55}{5} = 11$ → $y = 5(11)^x$
3. (0, 500), (1, 150) — x_1, y_1, x_2, y_2; $a = 500$; $b = \frac{150}{500} = 0.3$ → $y = 500(0.3)^x$
4. (1, 0.2), (0, 20) — x_2, y_2, x_1, y_1; $a = 20$; $b = \frac{0.2}{20} = 0.01$ → $y = 20(0.01)^x$
5. (-1, 12), (0, 3) — x_1, y_1, x_2, y_2; $a = 3$; $b = \frac{3}{12} = 0.25$ → $y = 3(0.25)^x$
6. (0, 1500), (1, 1800) — x_1, y_1, x_2, y_2; $a = 1500$; $b = \frac{1800}{1500} = 1.2$ → $y = 1500(1.2)^x$

Part C: Continuously Compounded Interest

$$A(t) = Pe^{rt}$$

1. An amount of $1,240.00 is deposited in a bank paying an annual interest rate of 2.85 %, compounded continuously. Find the balance after 2½ years.

$P = a = 1240$, $r = 0.0285$, $t = 2.5$

$A(t) = 1240 \cdot e^{0.0285 \cdot 2.5} = \$1331.57$

2. An amount of $2,340.00 is deposited in a bank paying an annual interest rate of 3.1%, compounded continuously. Find the balance after 3 years.

$P = 2340$, $r = 0.031$, $t = 3$

$2340 \cdot e^{0.031 \cdot 3} = \$2568.06$

3. An amount of $2,000.00 is deposited in a bank paying an annual interest rate of 2.85 %, compounded continuously.

(a) Find the balance after 3 years.

$P = 2000$, $r = 0.0285$, $t = 3$

$A(t) = 2000 \cdot e^{0.0285 \cdot 3} = \$2160.95$

(b) How long would it take for the money to double?

Double → $4000

Graph $y = 2000e^{0.0285t}$ and find t when $y > 4000$ → $t = 25$ years

4. If Matt puts $3000 into an account the pays 4.3% interest compounded continuously for 7 years how much will he have after 7 years?

$3000e^{0.043 \cdot 7} = \$4053.63$

5. Bailey has $10,000 to put into a bank account where the interest rate is 6.7% compounded continuously. How long must she keep the money in the bank so that the principal doubles?

$P = 10000$, $r = 0.067$, $t = ?$, $A = 20000$ (doubled)

Graph: $y = 10000e^{0.067t}$

$t = 11$ years when $y > 20000$