

The following data represents the amount of money an investor has in an investment account each year for 7 years.

STAT #1 Enter values in L1 + L2

L1	Years after 1990	4	5	6	7	8	9	10
L2	Value of account \$	20,000	21,516	23,355	24,885	27,434	30,053	32,622

Round your answers to the nearest thousandth.

1) a) Find an equation for the line of best fit for the data. $y = 2107.821x + 10940.25$
 STAT → Calc #4

b) Find the sum of the squared residuals. #7
 • Cursor to L3 2nd Stat ↓ Resid enter enter
 • Stat → Calc #1 1 var stats L3 (2nd 3)

$\sum x^2 = 1626867.11$

2) a) Find an exponential equation for the data. $y = 14274.806(1.085)^x$
 STAT → CALC #0

b) Find the sum of the squared residuals. $\sum x^2 = 328,586.518$

3) a) Find a quadratic equation for the data. $y = 133.369x^2 + 240.655x + 16941.857$
 STAT → Calc #5

b) Find the sum of the squared residuals. $\sum x^2 = 132,733.667$

4) Which model (linear, exponential, or quadratic) best fits the data above. Explain.

Quadratic model best fits the data because it has the smallest sum of squared residuals.

FST Midterm Review In Class 2

1) Julie hits a soft ball straight up at a speed of 110 ft/sec. ~~Her~~ Her bat contacts the ball 3 feet above the ground.

a) Write an equation for the height h (in feet above the ground) of the ball after t seconds.

Use the formula $h = -\frac{1}{2}gt^2 + v_0t + h_0$, where $g = 32 \text{ ft/sec}^2$

$$h = -\frac{1}{2}(32)t^2 + 110t + 3$$

$$h = -16t^2 + 110t + 3$$

b) Predict the height for the ball above the ground after 3 seconds.

$$h(3) = -16(3)^2 + 110(3) + 3 = 189 \text{ ft}$$

c) At what time will the ball hit the ground floor? (Hint - Use the Quadratic Formula)

$$0 = -16t^2 + 110t + 3$$

$$a = -16 \quad b = 110 \quad c = 3$$

$$x = \frac{-110 \pm \sqrt{(110)^2 - 4(-16)(3)}}{2(-16)}$$

$$x = \frac{-110 \pm \sqrt{12292}}{-32}$$

$$\frac{-110 + \sqrt{12292}}{-32} = -0.027$$

$$\frac{-110 - \sqrt{12292}}{-32} = 6.902 \text{ sec}$$

2) A certain substance has a half-life of 8 years. If a sample of 60 grams is being observed, how much will remain in 30 years?

$$y = a \cdot b^x$$

$$(0.5)^{1/8} = (1 - b^8)^{1/8}$$

$$b = 0.917$$

$$y = 60(0.917)^{30}$$

$$y = 4.46 \text{ grams}$$

FST Midterm Review In Class 3

1) Use the relation to answer the questions below:

$$y = \frac{2}{x+3} - 5$$

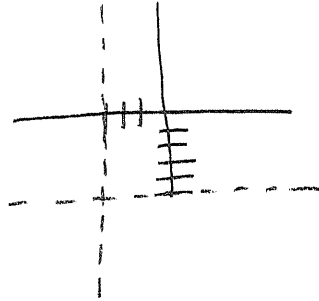
↗ Down 5

↳ Left 3

a) State the asymptotes

$$x = -3$$

$$y = -5$$



b) Is the relation a function? Explain.

Yes, passes vertical line test.

c) State the domain

$$D: \{x \mid x \neq -3\}$$

d) State the range

$$R: \{y \mid y \neq -5\}$$

e) Find the inverse of the relation

$$x = \frac{2}{y+3} - 5$$

+5 +5

$$\frac{x+5}{1} = \frac{2}{y+3}$$

$$\frac{2}{x+5} = \frac{2}{(x+5)(y+3)}$$

$$\frac{2}{x+5} = \frac{y+3}{-3}$$

$$y = \frac{2}{x+5} - 3$$

• left +5
• down 3

f) Is the inverse a function? Explain.

Yes, passes vertical line test.

f) State the domain of the inverse.

$$D: \{x \mid x \neq -5\}$$

g) State the range of the inverse.

$$R: \{y \mid y \neq -3\}$$

