2.4 Getting Down to Business

A Solidify Understanding Task

Calcu-rama had a net income of 5 million dollars in 2010, while a small competing company, Computafest, had a net income of 2 million dollars. The management of Calcu-rama develops a business plan for future growth that projects an increase in net income of 0.5 million per year, while the management of Computafest develops a plan aimed at increasing its net income by 15% each year.

$\frac{15}{100}$

$1 + .15 = 1.15$

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a. Create standard mathematical models (table, graph and equations) for the projected net income over time for both companies. (Attend to precision and be sure that each model is accurate and labeled properly so that it represents the situation.)

Calcu - rama:

year	$ (millions)	
(2010) 0	5 ⎫ +.5	5
(2011) 1	5.5 ⎭	5 +.5
(2012) 2	6	5 +.5 +.5
⋮	⋮	⋮
x	f(x)	5 + .5x

$f(x) = 5 + .5x$

Computafest:

year	$ (millions)	
(2010) 0	2 ⎫ ×1.15	2
(2011) 1	2.3 ⎬ ×1.15	2 × 1.15
(2012) 2	2.645 ⎭	2 × 1.15 × 1.15
⋮	⋮	⋮
x	f(x)	$2 (1.15)^x$

$f(x) = 2(1.15)^x$

b. Compare the two companies. How are the representations for the net income of the two companies similar? How do they differ? What relationships are highlighted in each representation?

Similarities
• both increasing

Differences
• one is linear + one is exponential
• starting amount
• one is adding a constant rate and one is multiplying
• one graphs straight and the other graphs curved

c. If both companies were able to meet their net income growth goals, which company would you choose to invest in? Why?

I would choose Computafest because it will earn more money than Calcu-rama over a long period of time.

d. When, if ever, would your projections suggest that the two companies have the same net income? How did you find this? Will they ever have the same net income again?

They would have the same net income after 23.24 years.

Used demos and found where they crossed each other.

No, they will never have the same net income again.

e. Since we are creating the models for these companies we can choose to have a discrete model or a continuous model. What are the advantages or disadvantages for each type of model?

Continuous
• income is constant throughout the year

Discrete
• income can flucuate throughout the year