

Playsheet 26

Linear Growth

MATH 130-03
Wednesday, April 9, 2008

Directions: Work together on each problem; do not delegate different problems to different people. Submit one **neatly written** write-up per group. Remember to use complete sentences as appropriate and to **show your work**.

1. You have started a business growing worms for research. The number of worms in your growing tank is increasing linearly. At the beginning of the year you have 150 worms. At the end of each succeeding month 30 new worms are born. Assuming that none of the worms die,
 - (a) Find a formula for the number of worms you have at the end of the N th month.
 - (b) How many worms will you have at the end of two years?
 - (c) At the end of what month will you have more than 10,000 worms?
2. Suppose that it costs \$0.20 each month for the food to feed a single worm.
 - (a) How much money will you need to spend on worm food for the first month?
 - (b) How much money will you need to spend on worm food for the 24th month?
 - (c) How much money will you need to spend on worm food during the first two years?
3. A city currently has 125 streetlights. As part of an urban renewal project, the city has decided to install two additional streetlights at the end of every week for the next 52 weeks.
 - (a) How many streetlights will the city have at the end of the 38th week?
 - (b) Each streetlight costs \$3 to operate for one week. How much must the city budget for streetlight operation over the period of the project? [The project ends at the moment the last two streetlights are installed.]