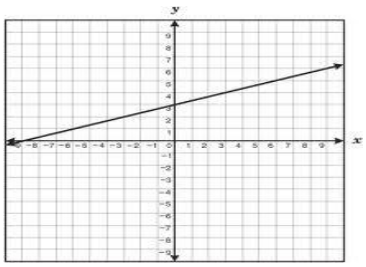
Algebra Concepts – Unit 1 Lesson 1

Types of Functions and Their Graphs

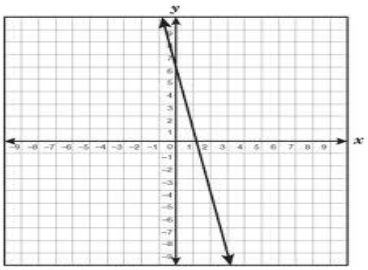
This Algebra course is mostly about three types of functions that occur frequently in real-life situations. In this lesson, you will examine common situations and decide which class of functions provides the best model for the situation. You will use the models below↓ to help you decide which type of function you should choose. You will see that many of these situations are similar to those you have already encountered or will encounter soon.

Graphs

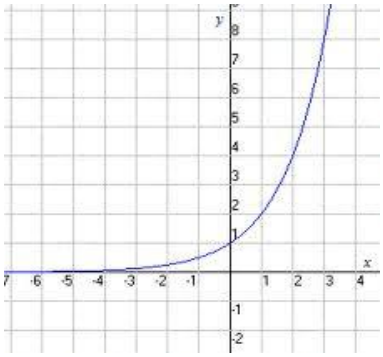
Linear increasing



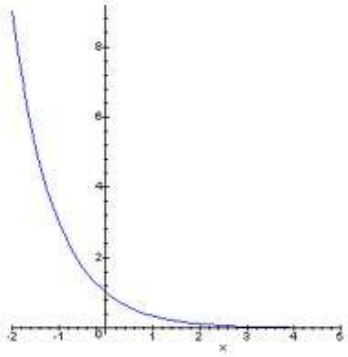
Linear decreasing



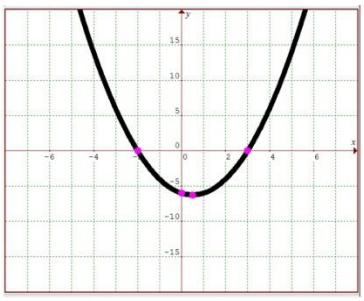
Exponential increasing



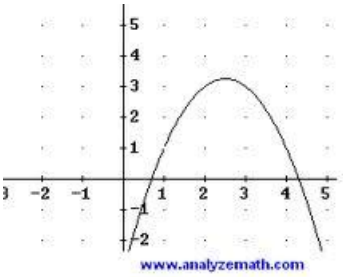
Exponential decreasing



Quadratic opens-up



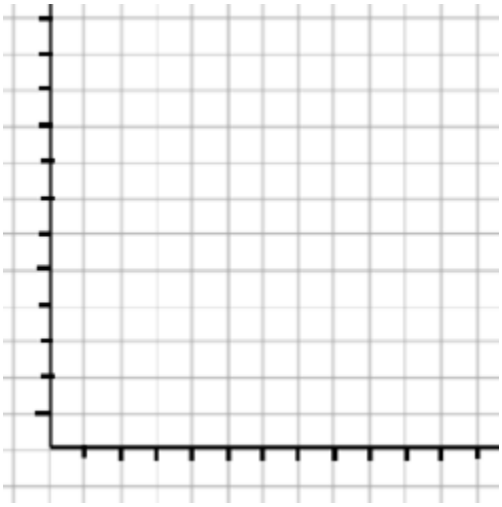
Quadratic opens-down



Class example

The student council is selling t-shirts to raise money for their class trip. If the student council charges too little, they will make almost no profit. If they charge a reasonable price, they will make a good profit. If they charge too much, fewer people will buy the t-shirts and their profit will decrease. The profit that the student council makes **is a function of** the price that they charge. Which type of function best models this situation?

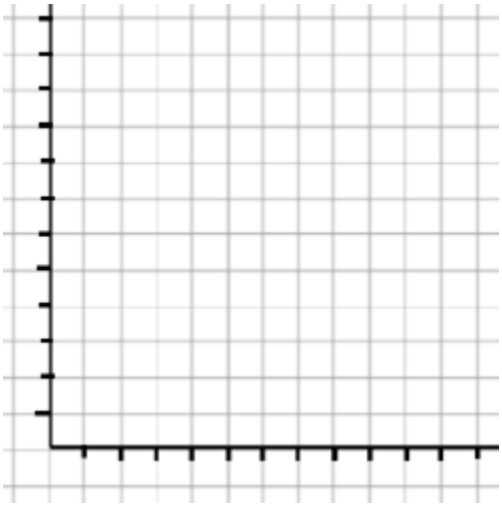
Label the axes then sketch the graph.



Guided practice 1

Nate earns $12 per hour in his landscaping job. The amount of money that he earns **is a function of** the number of hours that he works. Which type of function best models this situation?

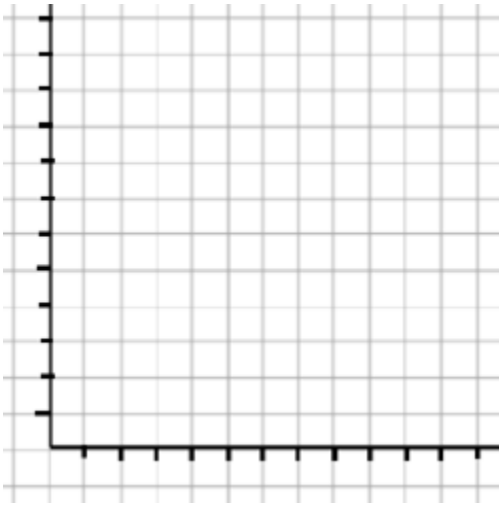
Label the axes then sketch the graph.



Guided practice 2

During the swine flu epidemic, the number of people in a local town who got swine flu increased by 40 percent each week during the month of December. The number of people with swine flu for the given time period **is a function of** time. Which type of function best models this situation?

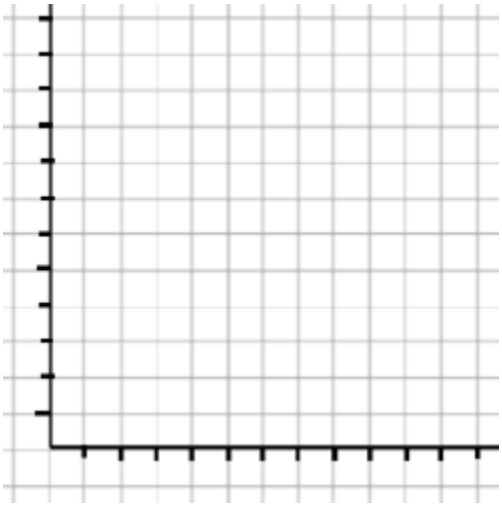
Label the axes then sketch the graph.



Guided practice 3

Karissa designs a skate board half-pipe that slopes dramatically on the side edges. The slope near the bottom of the half-pipe is more gradual. The height of a skate boarder in the half-pipe **is a function of** the distance the skate boarder is from the side edges. Which type of function best models this situation?

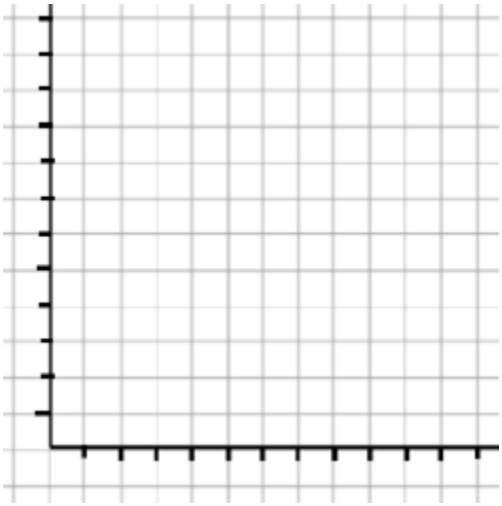
Label the axes then sketch the graph.



Guided practice 4

Several years ago, toxic waste dumped in a landfill seeped into the area groundwater. Each year after the toxic wasted was discovered, it would decrease by 25%. The amount of toxic waste in the groundwater **is a function of** years. Which type of function best models this situation?

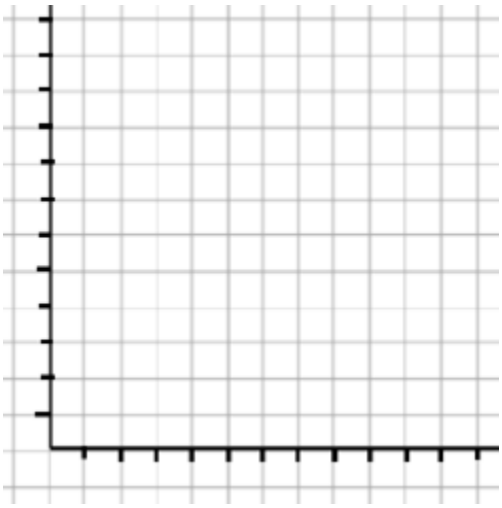
Label the axes then sketch the graph.



Guided practice 5

During a recent trip, Tyler discovered that the amount of fuel in her gas tank decreased at the rate of ¼ of a tank every hour that she drove along the highway. The amount of fuel in Tyler's tank **is a function of** the miles that she drives. Which type of function best models this situation?

Label the axes then sketch the graph.



For discussion: Can you think of any situations in your life that could be modeled by one of the functions we've discussed today?