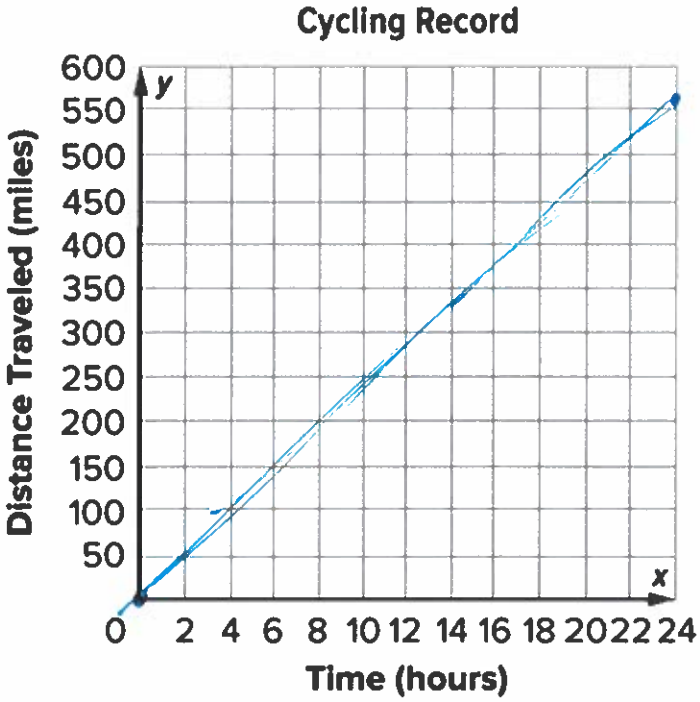
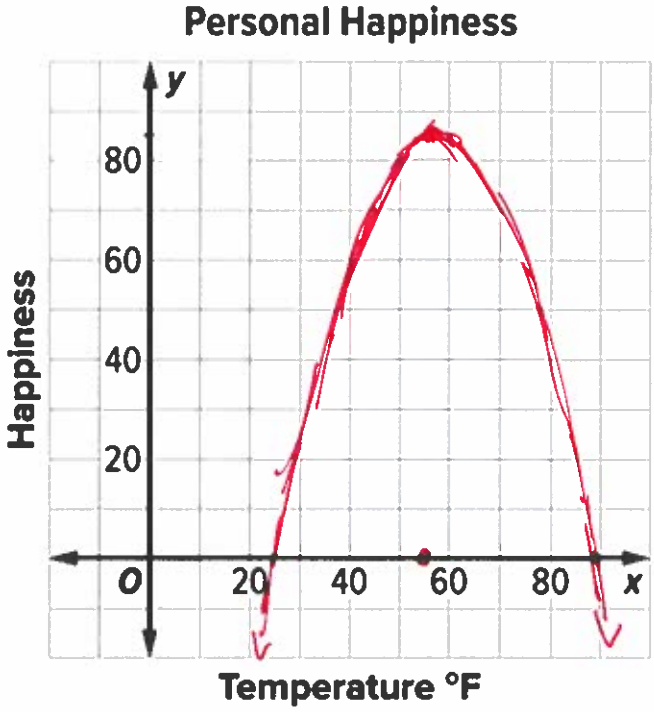
3.6 Sketching Graphs and Comparing Functions

1. In 2015, Christoph Strasser set a new 24-hour cycling record by riding 556 miles in a 24-hour period. The distance he rode over the 24 hours can be represented by a function. Move through the slides to see how to use the key features to sketch a graph that shows the distance traveled y as a function of time x.



y-Intercept: No distance has been traveled when he has ridden for 0 hours.
Linear or Nonlinear: The graph of the function is linear.
Positive: for time greater than 0
Increasing: for time greater than 0
End Behavior: As the number of hours he has ridden increases, the number of miles he has traveled increases.

2. A person's happiness can be affected by temperature. Move through the slides to see how to sketch a nonlinear graph that shows the happiness of a person y as a function of temperature x. Interpret the key features.



Positive: between about 25°F and 89°F
Negative: for temperatures less than 25°F and greater than 89°F
Increasing: for temperatures less than about 57°F
Decreasing: for temperatures greater than about 57°F
Relative Maximum: at about 57°F, when a person's happiness is about 85
End Behavior: As temperature increases or decreases, a person's happiness decreases.
Symmetry: A person's happiness for temperatures less than 57°F is the same as their happiness for temperatures greater than 57°F.

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3. The number of people in line for a roller coaster throughout the day can be modeled by a function. Move through the slides to see how to use the key features to sketch a graph of the function. Then interpret the key features if *x* represents the time in hours since the ride opened at 10:00 A.M. and *y* represents the number of people in line.

Positive: between x=−0.5 and x=12

Negative: for x<−0.5 and x>12

Increasing: for x<1.4 and between x=5.3 and x=9.9

Decreasing: for between x=1.4 and x=5.3 and for x>9.9

Intercepts: The graph intersects the *x*-axis at (−0.5,0) and (12,0) and intersects the *y*-axis at (0,220).

Relative Minimum: at (5.3,133)

Relative Maximum: at (1.4,448) and (9.9,643)

End Behavior: As *x* increases or decreases, the value of *y* decreases.