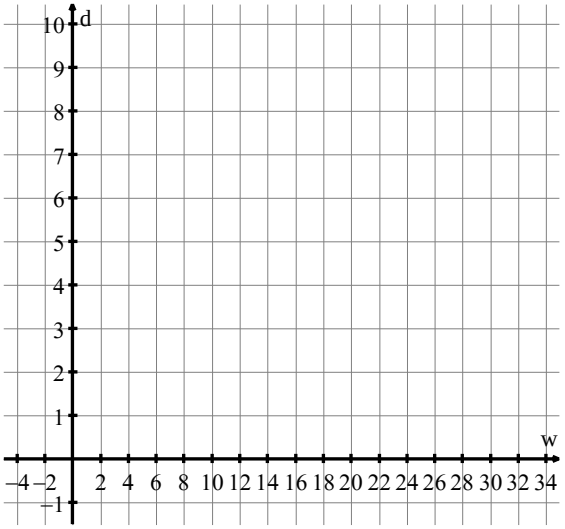
## Curve Fitting to Scatter Plots

Name: _____

Formulate an equation for each scatter plot using $y = a\sqrt{b(x-h)} + k$

1. Data for the diameter d in inches of a rope needed to lift a weight of w tons is given by the following table:

| Weight (w) | 9 | 14 | 16 | 20 | 23 | 27 |
|---|---|---|---|---|---|---|
| Diameter (d) | 4 | 5 | 5 | 5.5 | 6 | 6.5 |

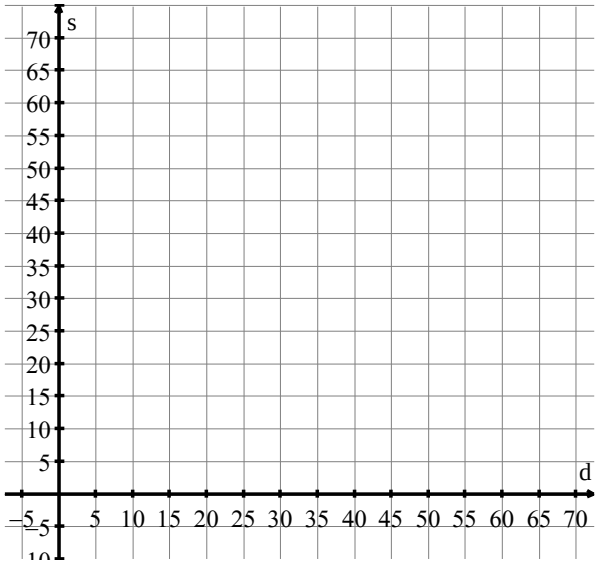



Equation:

Based on your formula, predict the diameter needed for a 35 ton elephant? Does this fit the model? Why or why not.

2. The data represents the speed s in miles per hour that a car is traveling when it goes into a skid where d is the length of the skid marks in feet for each speed.

| Length (d) | 30 | 35 | 40 | 45 | 50 | 55 |
|---|---|---|---|---|---|---|
| Speed (s) | 28 | 33.5 | 36 | 40 | 41 | 44.5 |

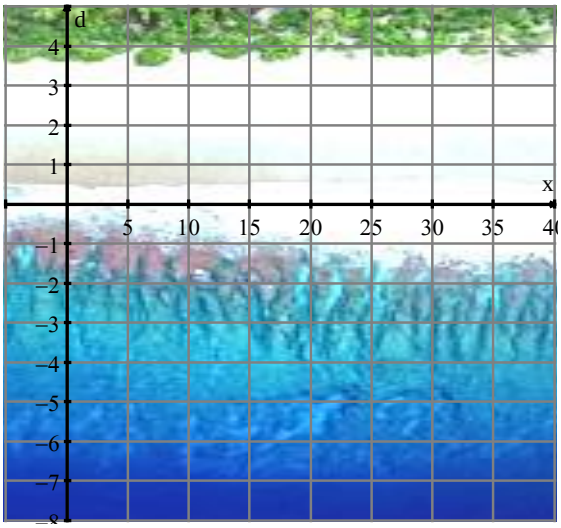



Equation:

The test car showed a skid length of 82 feet at a speed of 51 miles per hour. Does your equation/model validate the test data or is there a discrepancy and what is it?

3. Looking from a birds eye view, the following data represents the path of a speed boat at launch moving along a coast line where x is the horizontal distance in miles from launch and d is the distance in miles from the coast line. The x-axis represents the coast line.

| H. Distance (x) | 6 | 8 | 16 | 21 | 24 | 30 |
|---|---|---|---|---|---|---|
| Distance (d) | -1 | -1.5 | -1.7 | -2.4 | -2.3 | -2.5 |



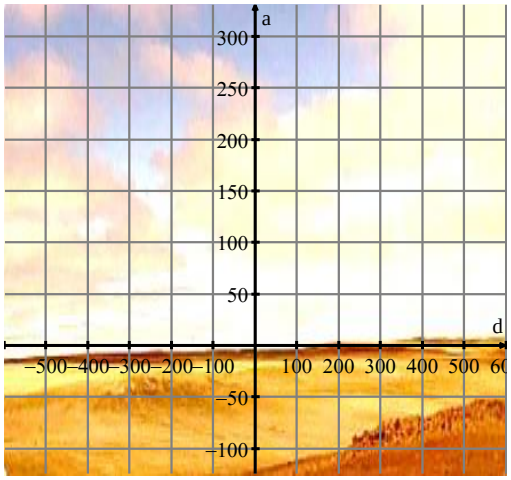

Equation:

Based on your formula, predict the horizontal distance the boat will be from its launching point when it is 4 miles off the coast line.

Assume the boat launches from a platform five miles off coast and moves in a similar path to the one above. How would this change your equation and what would the new data look like at the same horizontal distances.

4. The rover launched from Earth yesterday has now reached Mars and is attempting to touchdown on the surface. The data shown represents the altitude in terms of the distance to the actual landing spot:

| Distance (d) | -580 | -476 | -265 | -43 | 104 | 277 |
|---|---|---|---|---|---|---|
| Altitude (a) | 300 | 280 | 238 | 190 | 145 | 48 |




Equation:

If the priority landing site(where it should have landed) is at the origin, by how far did the rover overshoot the priority site when it landed? (when altitude is 0)