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Using Linear and Absolute Value Functions

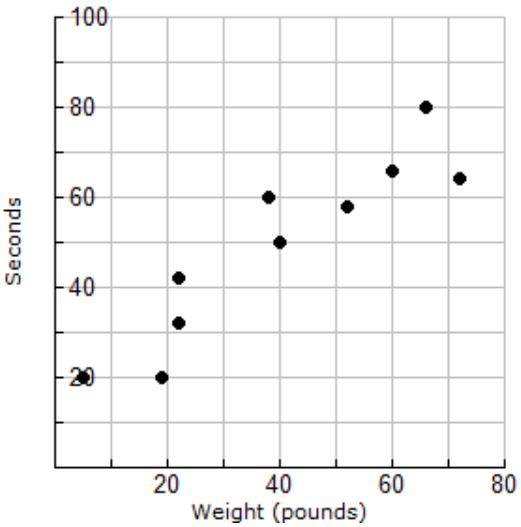
Independent Practice – Answer Key

Use the following scenario and table for questions 1 – 5.

Sarah recorded the weights of dogs and the time it took the same dogs to complete an agility course in seconds in the table below.

Weight of Dog (pounds)	Time to Complete Course (seconds)
5	20
19	20
22	32
22	42
38	60
40	50
52	58
60	66
66	80
72	64

1. Graph the data from the table on the grid below.



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2. Complete the statement to describe the relationship in the data.

The data appear to have a ***positive*** (positive or negative) ***linear*** (linear or nonlinear) correlation.

3. Generate the equation that represents a line of best fit.
y = 0.82x + 16.54

4. Does the correlation coefficient support your statement in problem #2? Explain why or why not.
Yes. The correlation coefficient is positive and the value is close to one.

5. Use the equation from #3 to predict how long it would take a dog to run the agility course if the dog weighed 90 pounds.
About 90 seconds

Use the following scenario and table for questions 6 – 9.

A football field is 100 yards long and has marked yard lines every 5 yards with each yard line marked along both sidelines and along two sets of hash marks inside the field.

Distance from One End Zone (yd)	0	10	20	30	40	50	60	70	80	90	100
Marked Yard Line	0	10	20	30	40	50	40	30	20	10	0

6. Use the data in the table to write a function, $f(x)$, that could be used to determine the marked yard line if you know x, the distance from one end zone to that yard line.
f(x) = −|x − 50| + 50

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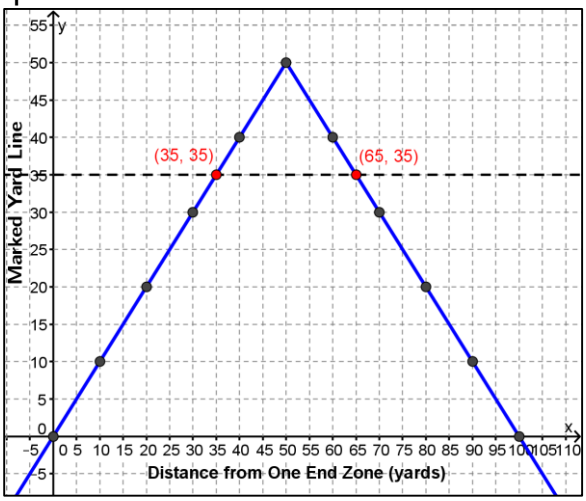
7. Use your function to write an equation you could use to solve for x, the distance from one end zone if the football is on the 35 yard line.
35 = −|x − 50| + 50

8. Make a scatterplot of the data and graph the function over the scatterplot. Use the graph to show the solution to your equation from question #7.



9. Solve your equation from question #7 symbolically. Write your solution in set notation.
x = 35, 65
The solution set is {35, 65}.

For questions 10 – 13, solve the equation or inequality.

10. $|4(x - 6.5)| = 24$
x = 0.5, 24.5 or {0.5, 24.5}

12. $|4x - 9| < 23$
−3.5 < x < 8

11. $|\frac{3}{4}(8x + 12)| = 5$
x = $-\frac{2}{3}$ and $-2\frac{1}{3}$ or $\{-\frac{2}{3}, -2\frac{1}{3}\}$

13. $|3(2x + 5)| > 40$
x < −9 and x > 4

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For questions 14 – 15, identify the transformations that would be done to $f(x) = |x|$ in order to generate the given function.

14. $g(x) = 3|x - 5| + 11$

Translate f(x) 5 units to the right and 11 units up then vertically stretch the graph by a factor of 3.

15. $h(x) = -\frac{1}{2}|x + 2| - 2.5$

Translate f(x) 2 units to the left and 2.5 units down, vertically compress the graph by a factor of $\frac{1}{2}$, then reflect the graph across the line y = −2.5.