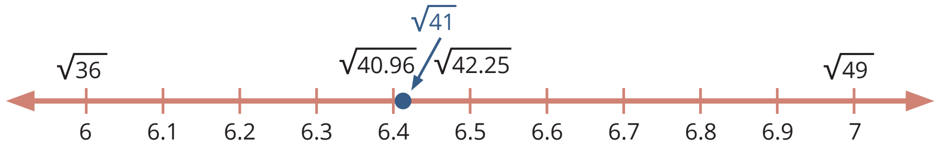
Name ____________________ Date **Answer Key**

APPROXIMATIONS OF SQUARE ROOTS ON NUMBER LINES

You can approximate irrational square roots and plot your approximations on number lines.
Let's try it! Follow the steps below to approximate $\sqrt{41}$ and plot the approximation on a number line.

1	Find the perfect squares that 41 lies between.	The number 41 lies between the perfect squares 36 and 49. So, $\sqrt{41}$ lies between $\sqrt{36}$, or 6, and $\sqrt{49}$, or 7.
2	Approximate $\sqrt{41}$ to the nearest tenth. Choose decimals between 6 and 7, and square them to find the decimals that $\sqrt{41}$ falls between.	Since 41 is about halfway between 36 and 49, square a decimal about halfway between 6 and 7. Here, let's try 6.5. $6.5^2 = 42.25$ *Since $6.5^2 > 41$, a square root of 6.5 is too large. Square 6.4.* $6.4^2 = 40.96$ *Since $6.4^2 < 41$, a square root of 6.4 is too small.* $\sqrt{41}$ must be between 6.4 and 6.5. Since 41 is closer to 6.4^2 than 6.5^2, 6.4 is the better approximation for $\sqrt{41}$. So, $\sqrt{41} \approx 6.4$.
3	Label the number line from 6 to 7, and plot the approximation.	You know $\sqrt{41}$ is slightly bigger than 6.4, so plot the approximation slightly to the right of 6.4.



Practice! Approximate each irrational square root to the nearest tenth. Then, label the number line and plot the approximation.

1 $\sqrt{13} \approx$ **3.6**

2 $\sqrt{61} \approx$ **7.8**

3 $\sqrt{22} \approx$ **4.7**

4 $\sqrt{84} \approx$ **9.2**

Challenge! Think about how you could find more accurate approximations. How could you find an approximation to the nearest hundredth?