

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.

<p>1 Find the perfect squares that 41 lies between.</p>	<p>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.</p>
<p>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.</p>	<p>Since 41 is about halfway between 36 and 49, square a decimal about halfway between 6 and 7. Here, let's try 6.5.</p> <p style="text-align: center;">$6.5^2 = 42.25$ Since $6.5^2 > 41$, a square root of 6.5 is too large. Square 6.4.</p> <p style="text-align: center;">$6.4^2 = 40.96$ Since $6.4^2 < 41$, a square root of 6.4 is too small.</p> <p>$\sqrt{41}$ 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, $\sqrt{41} \approx 6.4$.</p>
<p>3 Label the number line from 6 to 7, and plot the approximation.</p>	<p>You know $\sqrt{41}$ is slightly bigger than 6.4, so plot the approximation slightly to the right of 6.4.</p>

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

<p>1 $\sqrt{13} \approx$ _____</p>	<p>2 $\sqrt{61} \approx$ _____</p>
<p>3 $\sqrt{22} \approx$ _____</p>	<p>4 $\sqrt{84} \approx$ _____</p>



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