REVIEW: Approximating Square Roots
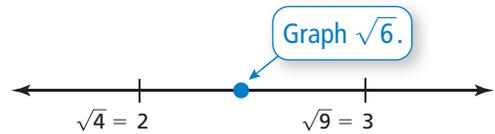
Name _____

Key Concept and Vocabulary

To approximate a square root to the nearest integer, use a number line and the square roots of the perfect squares nearest to the number. Then determine which perfect square is closer to the radicand.

Approximating
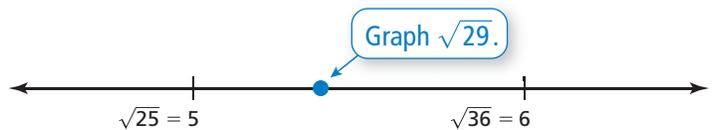
Visual Model

Graph $\sqrt{6}$.

$\sqrt{4} = 2$ $\sqrt{9} = 3$

$\sqrt{6} \approx 2$ because 6 is closer to 4 than to 9.

Skill Examples

1. $\sqrt{29} \approx 5$

The nearest perfect square less than 29 is 25. The nearest perfect square greater than 29 is 36. Because 29 is closer to 25 than to 36, $\sqrt{29}$ is closer to 5 than to 6.

Graph $\sqrt{29}$.

$\sqrt{25} = 5$ $\sqrt{36} = 6$

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Check your answers at BigIdeasMath.com.

Estimate to the nearest integer.

2. $\sqrt{60} \approx$ __8__

3. $\sqrt{14} \approx$ __4__

4. $\sqrt{86} \approx$ __9__

5. $\sqrt{19} \approx$ __4__

6. $\sqrt{77} \approx$ __9__

7. $\sqrt{138} \approx$ __12__

8. $-\sqrt{45} \approx$ __−7__

9. $-\sqrt{103} \approx$ __−10__

Graph the two numbers. Then compare them using < or >.

10. 5 $\boxed{>}$ $\sqrt{5}$

$\sqrt{5}$ 5
0 1 2 3 4 5 6 7

11. $3\frac{1}{4}$ $\boxed{<}$ $\sqrt{13}$

$3\frac{1}{4}$ $\sqrt{13}$
3   $3\frac{1}{4}$ $3\frac{1}{2}$ $3\frac{3}{4}$ 4

12. $\sqrt{20}$ $\boxed{<}$ $4\frac{4}{5}$

$\sqrt{20}$ $4\frac{4}{5}$
4 $4\frac{1}{4}$ $4\frac{1}{2}$ $4\frac{3}{4}$ 5

13. $\sqrt{47}$ $\boxed{>}$ 6.1

6.1 $\sqrt{47}$
6   6.5   7

14. 9.3 $\boxed{<}$ $\sqrt{96}$

9.3 $\sqrt{96}$
9   9.5   10

15. -3.5 $\boxed{>}$ $-\sqrt{15}$

$-\sqrt{15}$ -3.5
−4   −3.5   −3
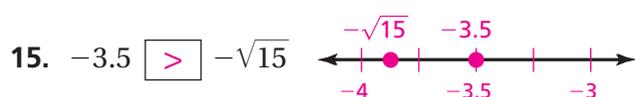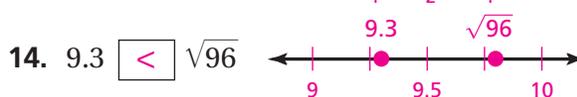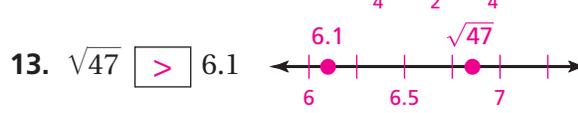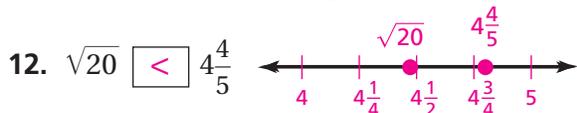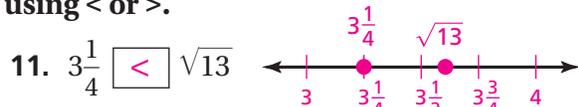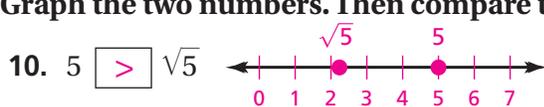
16. PLATE The radius of a circle with area A is approximately $\sqrt{\dfrac{A}{3}}$. The area of a plate is 81 square inches. Estimate the radius of the plate to the nearest inch. __5 inches__

17. DECK The area of a square deck is 248 square feet. Estimate the length of one side of the deck to the nearest foot. __16 feet__