

Grade 8 Math Test #1 Review: A-1 & A-2

What is a square root?

Do all natural numbers have square roots? Explain.

3. Explain how to calculate the side length of a square if you know its area.

4. Draw each square on grid paper. Write the side length.

- (a) 16 cm^2 (b) 36 cm^2
 (c) 100 cm^2 (d) 64 cm^2

5. Write each number as a product of two equal factors.

- (a) 25 (b) 49
 (c) 144 (d) 121

6. Write the perfect square of every number from 1 to 15. Fill in as many ~~as you can from memory and then use a calculator to find the rest.~~

7. ~~Write~~ write each square root from ~~Exercise 6~~. Refer to your list from Exercise 6 for the ones you don't know.

- (a) $\sqrt{9}$ (b) $\sqrt{144}$
 (c) $\sqrt{169}$ (d) $\sqrt{225}$
 (e) $\sqrt{16}$ (f) $\sqrt{121}$
 (g) $\sqrt{36}$ (h) $\sqrt{100}$
 (i) $\sqrt{49}$ (j) $\sqrt{196}$
 (k) $\sqrt{81}$ (l) $\sqrt{64}$

8. Example 2 showed how to use squares to estimate the square root of 56. Use a similar method to estimate the square root of 20. You can draw your model on grid paper if you like.

9. ~~Use the number line from Example 3 to~~ estimate each square root.

- (a) $\sqrt{40}$
 (b) $\sqrt{30}$
 (c) $\sqrt{80}$

10. Estimate each square root. ~~Show your work.~~ Compare your estimate with the calculator result.

- (a) $\sqrt{57}$ (b) $\sqrt{45}$
 (c) $\sqrt{21}$ (d) $\sqrt{133}$
 (e) $\sqrt{72}$ (f) $\sqrt{98}$

11. Use the square root key on a calculator. Express each root to the nearest tenth.

- (a) $\sqrt{17}$
 (b) $\sqrt{28}$
 (c) $\sqrt{117}$
 (d) $\sqrt{350}$
 (e) $\sqrt{219}$
 (f) $\sqrt{399}$

12. Josh used a calculator to find $\sqrt{5}$ and rounded the result to 2.24. To check, he entered 2.24×2.24 .

- (a) What product did Josh get?
 (b) Why is the product not 5?

13. Josh wanted to express the $\sqrt{5}$ as accurately as possible. This time, he copied the entire decimal number from the calculator display: 2.236 067.

To check, he entered $2.236\ 067 \times 2.236\ 067$. To his surprise, the calculator still did not show 5 as a product.

- (a) What product did the calculator show?
 (b) Why is the product not exactly 5?

14. Jenny also used a calculator to find $\sqrt{5}$. To check her calculation, she pressed $\sqrt{\square}$ while the square root, 2.236 067 977 was still showing in the display.

Try Jenny's method with your calculator.

- (a) What product do you get this time?
 (b) Why do you think that Jenny's product is different from the one Josh got in Exercise 13?

15. The square root of 81 is 9, because $9 \times 9 = 81$.

- (a) What negative number multiplied by itself gives a product of 81?
- (b) How many square roots does a perfect square usually have?
- (c) What number has exactly one square root?

The $\sqrt{\quad}$ sign usually indicates the positive square root. If the negative square root is needed, the sign is $-\sqrt{\quad}$.

16. This rectangle is half of a square. If the square has an area of 7.84 cm^2 , what are the side lengths of the rectangle?



17. Use a calculator to find these values.

- a) $\sqrt{0.49}$
- b) $\sqrt{0.01}$
- c) $\sqrt{0.09}$

d) Do you notice any pattern?

18. If the ratio of pedal turns to wheel turns is 3 : 2, how many turns will the wheel make for each number of pedal turns? Tell how you decided.

- a) 12
- b) 21
- c) 30
- d) 90

19. Evaluate the following expressions. Be sure to follow the order of operations (BEMDAS).

- a) $\sqrt{2 \times 8}$
- b) $\sqrt{3 + 12} \div 2$
- c) $\sqrt{10 - 4} \div 4$
- d) $\sqrt{12 \times 12}$

20. Jimmy says if he takes the square root of any number and then squares it, he gets the number he started with. Johnny tells him its not true. Who is right?

21. Evaluate.

- a. $\sqrt{144}$
- e. $\sqrt{400}$
- g. $\sqrt{256}$
- i. $\sqrt{625}$
- b. $\sqrt{4.84}$
- d. $\sqrt{0.81}$
- f. $\sqrt{1.69}$
- h. $\sqrt{0.25}$

Find a number with a square root between the given numbers.

- a. 7 and 8
- e. 11 and 12
- g. 4 and 5
- b. 9 and 10
- d. 1 and 2
- f. 3 and 4

22. Wrestling is usually performed on a square mat with area 144 m^2 . What are the dimensions of the mat?

23. The area of a square stamp is 2.89 cm^2 . What are its dimensions?

24. A warehouse has an area of 2940 m^2 . It is divided into 15 equal square sections. Find the dimensions of each section.

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- a) List the perfect squares from 1 to 400.
- b) Examine the last digit in each perfect square. Write a rule that will help you to identify a perfect square from its last digit.
- c) Use your rule to decide which of the following numbers might be perfect squares.

Then, use your calculator to check.

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|------|------|------|------|------|
| 1983 | 551 | 961 | 3481 | 987 |
| 2025 | 3175 | 1296 | 1896 | 1022 |

26. A cube has a surface area of 96 cm^2 . What are the dimensions of the cube? Solve using square root.