

Name: _____ Period: _____
Math 9: Real Numbers and Square Roots Quiz

Full credit will only be awarded for all work shown in a neat and organized manner.

1. Write down a number that is an integer but not a whole number. Explain your answer.

Int: $\ominus 3, \ominus 2, \ominus 1, 0, 1, 2, 3, \dots$

whole: $0, 1, 2, 3, \dots$

2. Write down a number that is a real number but not a rational number. Explain your answer.

Real: Nat, whole, Int, Rat, Irr

Any \ominus integer $(-1, -2, -3, \dots)$ Any Irr $\# (\pi, \sqrt{3}, 0.52743\dots)$

3. For each number, write down ALL number categories that it belongs to (natural, whole, integers, rational, irrational, real).

a) 0 whole, Integer, Rational, iReal

b) $-73.\overline{895}$ Rational, Real

c) $\sqrt{-5}$ None

d) $\sqrt{25}$ Natural, whole, Integer, Rational, iReal

4. EXPLAIN why the number 361 is a Perfect Square.

Any whole number squared is a perfect square
Since $361 = 19^2$, it is a perfect square

5. Evaluate each square root. Write your answer as a fraction or integer.

(If the answer does not exist, write the answer as \emptyset)

a) $\sqrt{\frac{4}{121}} = \frac{\sqrt{4}}{\sqrt{121}} = \boxed{\frac{2}{11}}$

b) $-\sqrt{\frac{81}{100}} = -\frac{\sqrt{81}}{\sqrt{100}} = \boxed{-\frac{9}{10}}$

c) $\sqrt{4^2 - 5^2} = \sqrt{16 - 25} = \sqrt{-9} = \boxed{\emptyset}$

d) $\sqrt{8^2} - \sqrt{12^2} = 8 - 12 = \boxed{-4}$

e) $(\sqrt{4} + \sqrt{16})^2 = (2 + 4)^2 = 6^2 = \boxed{36}$

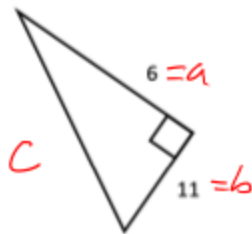
6. Find a whole number whose square root is between 12 and 13. (Explain your reasoning)

$$\sqrt{144} = 12 \quad \text{square root of any number from}$$

$\Rightarrow 145 - 168$ works

$$\sqrt{169} = 13 \quad (\sqrt{150} = 12.247\dots)$$

7. Solve for the length of the missing side. Answer exactly with a square root, then to one decimal place.



$$c^2 = a^2 + b^2$$

$$c^2 = 6^2 + 11^2$$

$$c^2 = 36 + 121$$

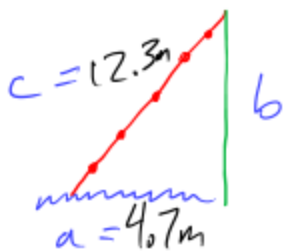
$$c^2 = 157$$

$$c = \sqrt{157}$$

$$c = 12.5$$

8. Taylor is leaning a 12.3m ladder against a wall. If the bottom of the ladder is 4.7m from the bottom of the wall, how high is the top of the ladder above the ground? (HINT: Draw a picture!)

[Answer to one decimal place]



$$b^2 = c^2 - a^2$$

$$b^2 = 12.3^2 - 4.7^2$$

$$b^2 = 151.29 - 22.09$$

$$b^2 = 129.2$$

$$b = \sqrt{129.2} = 11.4\text{m}$$