

Quiz 2 - Answers

1. Let $A = \{1, 4, 7\}$, $B = \{0, 1, 2\}$, and $C = \{1, 2, 3, 4, 5\}$.
Find $(A \cup B) \cap C$.

Answer. Start from the inside of the parentheses, and first find $A \cup B$. To take the union of two sets, we combine them. In this case, we find that $A \cup B = \{0, 1, 2, 4, 7\}$ (remember, we don't care if an element is in the set twice). Now, the equation becomes:

$$(\{0, 1, 2, 4, 7\}) \cap \{1, 2, 3, 4, 5\}.$$

To take the intersection, we look only at the elements which both sets have in common. These are

$$\{1, 2, 4\}.$$

□

2. Simplify

$$1.2 \div (-0.48)$$

Answer. First, we want to get rid of the decimals, so move the decimal two places to the right on both sides (we can do this since the two numbers are being divided by each other). This gives us

$$120 \div 48 = \frac{120}{48} = \frac{5}{2},$$

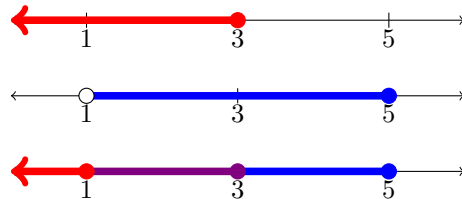
and we are done. We could also do this with long division, if we wanted, and should end up with $2.5 (= \frac{5}{2})$. □

3. Simplify, and write in interval notation AND inequality notation

a) $(-\infty, 3] \cup (1, 5]$

b) $(-\infty, 3] \cap (1, 5]$

Answer. Draw number lines!



Now, the union is their combination, which is everything that is colored in the last line. In interval notation this is $(-\infty, 5]$, in inequality notation it is $x \leq 5$.

For the union, we look at what the two have in common, which is colored purple in the third line. In interval notation this is $(1, 3]$, and in inequality notation it is $1 < x \leq 3$.

□

4. True or False?

- a) The distance between 3 and -4 is 7.
- b) $|x| = |-x|$ for all x .
- c) $|2 - \pi| = 2 + \pi$.
- d) $\sqrt{36}$ is a rational number.

Answer.

- a) True: $|3 - (-4)| = |7| = 7$
- b) True: $|-x| = |(-1)(x)| = |-1||x| = |x|$
- c) False: $2 - \pi$ is negative, so
 $|2 - \pi| = -(2 - \pi) = -2 + \pi = \pi - 2$.
- d) True: $\sqrt{36} = 6$, which is a natural number, and so it is also a whole number, an integer, a rational, and a real number.

□