

1.2

Integer, Rational, and Irrational Numbers

• Example 1

For each of the four number systems (integer, rational, irrational, real), give all numbers from the list below that are members.

$$\left\{ \sqrt{49}, \frac{\pi}{2}, 0.\overline{33}, -\sqrt{7} \right\}$$

Begin by determining the smallest set to which each belongs by simplifying or rewriting if possible.

$$\sqrt{49} = 7 \text{ is an integer.}$$

$$\frac{\pi}{2} \text{ is in simplest form and is irrational.}$$

$$0.\overline{33} \text{ can be written as } \frac{1}{3}, \text{ a rational number.}$$

$$-\sqrt{7} \text{ is in simplest form and is irrational}$$

Therefore, we have

$$\text{integer: } \left\{ \sqrt{49} \right\}$$

$$\text{rational: } \left\{ 0.\overline{33}, \sqrt{49} \right\}$$

$$\text{irrational: } \left\{ \frac{\pi}{2}, -\sqrt{7} \right\}$$

$$\text{real: } \left\{ \sqrt{49}, \frac{\pi}{2}, 0.\overline{33}, -\sqrt{7} \right\}$$

● ● ● CHECK YOURSELF 1

For each of the four number systems (integer, rational, irrational, real), give all numbers from the list below that are members.

$$\left\{ 56.75, \sqrt{2}, \sqrt{\frac{9}{4}}, \frac{\sqrt{36}}{3} \right\}$$

● ● ● CHECK YOURSELF ANSWER

1. integer: $\left\{ \frac{\sqrt{36}}{3} \right\}$

rational: $\left\{ 56.75, \sqrt{\frac{9}{4}}, \frac{\sqrt{36}}{3} \right\}$

irrational: $\left\{ \sqrt{2} \right\}$

real: $\left\{ 56.75, \sqrt{2}, \sqrt{\frac{9}{4}}, \frac{\sqrt{36}}{3} \right\}$

1.2 Exercises

Name _____

Section _____

Date _____

A N S W E R S

For each of the four number systems, (integer, rational, irrational, real), give all numbers from each list below that are members.

1. $\left\{-\sqrt{100}, 2\pi, 1.5, \frac{8}{5}\right\}$

2. $\left\{-\sqrt{10}, -3.65, 18, -\frac{8\pi}{2\pi}\right\}$

3. $\left\{\sqrt{1}, \frac{\sqrt{29}}{8}, \frac{99}{11}, -18.34\right\}$

4. $\left\{\frac{0}{\sqrt{3}}, \frac{\sqrt{8}}{\sqrt{2}}, 14, 42.3\right\}$

5. $\left\{\frac{\sqrt{6}}{3}, \frac{25}{24}, -\sqrt{32}, 41\right\}$

6. $\left\{\frac{\sqrt{144}}{12}, \frac{18\pi}{2}, 37.92, \frac{18}{6}\right\}$

7. $\left\{-2.75, \frac{87}{4}, -\frac{\sqrt{37}}{37}, \frac{\sqrt{27}}{\sqrt{3}}\right\}$

8. $\left\{13.5, -106, -\frac{49}{7}, \sqrt{20}\right\}$

9. $\left\{\frac{360}{45}, \sqrt{400}, 28.4, \frac{\sqrt{10}}{6}\right\}$

10. $\left\{\frac{18\pi}{2}, \frac{113}{7}, 22.22, \frac{98}{7}\right\}$

11. $\left\{\frac{\sqrt{28\pi}}{\pi}, 83.7, \frac{7}{114}, 22\right\}$

12. $\left\{-\pi, 14.7, -32, \frac{12}{3}\right\}$

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____