

Name the sets of numbers to which each of the following numbers belongs.

1. $\sqrt{81} = 9$

2. 7

3. $15/16$

4. 3.558107...

5. 5.87

R,Q,Z,W,N

R,I

R,Q

6. -4

7. 7.04

8. $\sqrt{23}$

9. $\sqrt{100}$

10. 1.312321...

R,I

R,I

State the property of real numbers illustrated in each problem.

11) $12(d + 9) = 12(d) + 12(9)$

12) $t + (-t) = 0$

13) $w(1) = w$

14) $5(y) = y(5)$

15) $g(8 \cdot k) = (g \cdot 8)k$

16) $(5/12)(12/5) = 1$

17) $q + 0 = q$

18) $b + (-b) = 5$

Mult. Inverse

Add. Identity

Not a property

19) $(z + 7) = (7 + z)$

20) $12 \div p = p \div 12$

21) $6 + (9 + j) = (6 + 9) + j$

Not a Property

Associative (+)

Simplify the following expressions.

22) $(\frac{3}{4})^2$

23) $(\frac{1}{2})^3$

24) $(\frac{5}{3})^2$

25) $(\frac{9}{6})^4$

26) $(\frac{10}{5})^5$

27) $(\frac{6}{8})^3$

$$= \frac{3^2}{4^2} = \frac{9}{16}$$

$$= \frac{1^3}{2^3} = \frac{1}{8}$$

$$= \frac{3^4}{2^4} = \frac{81}{16}$$

$$= 2^5 = 32$$

28) $\sqrt{\frac{9}{4}}$

29) $\sqrt{\frac{36}{49}}$

30) $\sqrt{\frac{18}{25}}$

31) $\sqrt{\frac{75}{16}}$

32) $\sqrt{\frac{36}{16}}$

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

$$= \frac{\sqrt{9 \cdot 2}}{\sqrt{25}} = \frac{3\sqrt{2}}{5}$$

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

33) $\sqrt{\frac{1}{9}}$

34) $\sqrt{\frac{12}{5}}$

35) $\sqrt{\frac{24}{16}}$

36) $\sqrt{\frac{50}{27}}$

37) $\sqrt{\frac{11}{8}}$

$$= \frac{\sqrt{4 \cdot 3}}{\sqrt{5}}$$

$$= \frac{2\sqrt{3}}{\sqrt{5}}$$

$$= \frac{2\sqrt{3}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} \quad (\text{Rationalize})$$

$$= \frac{2\sqrt{15}}{\sqrt{25}} = \boxed{\frac{2\sqrt{15}}{5}}$$

$$= \sqrt{\frac{3}{2}}$$

$$= \frac{\sqrt{3}}{\sqrt{2}}$$

$$= \frac{\sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \quad (\text{Rationalize})$$

$$= \frac{\sqrt{6}}{\sqrt{4}} = \boxed{\frac{\sqrt{6}}{2}}$$

$$= \frac{\sqrt{25 \cdot 2}}{\sqrt{9 \cdot 3}}$$

$$= \frac{5\sqrt{2}}{3\sqrt{3}}$$

$$= \frac{5\sqrt{2}}{3\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} \quad (\text{Rationalize})$$

$$= \frac{5\sqrt{6}}{3\sqrt{9}} = \frac{5\sqrt{6}}{3 \cdot 3}$$

$$= \boxed{\frac{5\sqrt{6}}{9}}$$

38) $\sqrt{\frac{1}{10}}$

39) $\sqrt{\frac{6}{16}}$

40) $\sqrt[3]{\frac{1}{8}}$

41) $\sqrt[3]{\frac{54}{2}}$

42) $\sqrt[3]{\frac{1}{3}}$

$$= \frac{\sqrt{1}}{\sqrt{10}}$$

$$= \frac{\sqrt{1}}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} \quad (\text{Rationalize})$$

$$= \frac{\sqrt{10}}{\sqrt{100}}$$

$$= \boxed{\frac{\sqrt{10}}{10}}$$

$$\frac{\sqrt[3]{1}}{\sqrt[3]{8}} = \boxed{\frac{1}{2}}$$

$$= \sqrt[3]{\frac{27}{27}} = \boxed{3}$$

$$= \frac{\sqrt[3]{1}}{\sqrt[3]{3}}$$

$$= \frac{\sqrt[3]{1}}{\sqrt[3]{3}} \cdot \frac{\sqrt[3]{9}}{\sqrt[3]{9}} \quad (\text{Rat.})$$

$$= \frac{\sqrt[3]{9}}{\sqrt[3]{27}}$$

$$= \boxed{\frac{\sqrt[3]{9}}{3}}$$