Part A: Real Numbers

Practice 1

1.

$\sqrt{81} = 9$: {natural (N), whole (W), integer (Z), rational (Q), real (R)}

2.

0: {whole (W), integer (Z), rational (Q), real (R)}

3.

$\frac{8}{11}$: {rational (Q), real (R)}

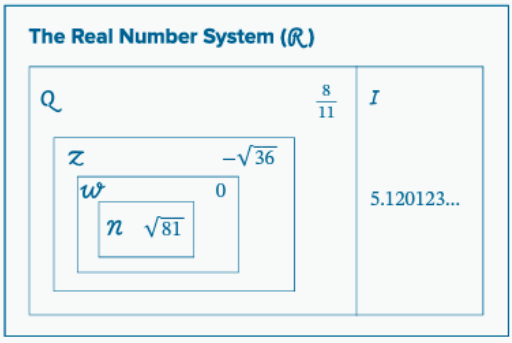
4.

5. 12012301234012345...: {irrational (I), real (R)}

5.

$-\sqrt{36}$: {integer (Z), rational (Q), real (R)}

6.



7.

A: $-24\left(\frac{1}{12}\right) = -2$: integer ($Z$)

8.

B: $\pi - 3 = 0.14159...$: irrational (I)

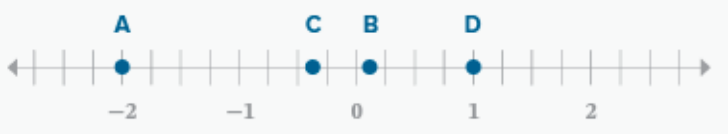
9.

C: $\frac{2}{3} - 1 = -\frac{1}{3}$: rational ($Q$)

10.

D: $\sqrt{25} - \sqrt{16} = 5 - 4 = 1$: natural ($N$)

11.



12.
always

13.
never

14.
always

Practice 2

1.
$\sqrt{2}$: {irrational (I), real (R)}

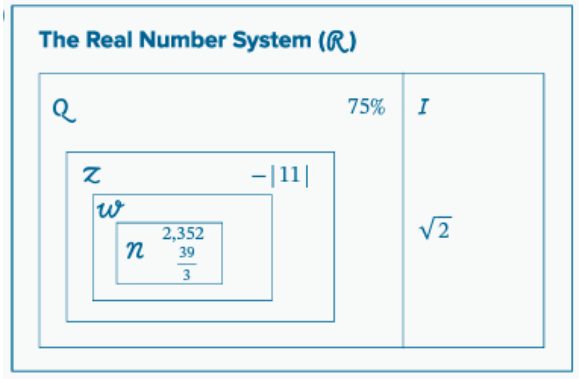
2.
$\frac{39}{3} = 13$: {natural (N), whole (W), integer (Z), rational (Q), real (R)}

3.
$-|11|$: {integer (Z), rational (Q), real (R)}

4.
$75\% = \frac{3}{4}$: {rational (Q), real (R)}

5.
2,352: {natural (N), whole (W), integer (Z), rational (Q), real (R)}

6.



7.
$\frac{5}{2} + \frac{1}{2} = 3$: natural ($N$)

8.
$\frac{1}{9} - \frac{5}{9} = -\frac{4}{9}$: rational ($Q$)

9.
$\sqrt{5}(0) = 0$: whole (W)

10.
$\pi - \pi = 0$: whole (W)

11.

12. Rational numbers include all natural numbers, whole numbers, and integers.

Part B: Algebraic Properties

Practice 1

1.
Commutative Property

2.
Inverse Property (of Multiplication)

3.
Zero-Product Property

4.
Distributive Property

5.
Inverse Property (for Addition)

6.
Identity Property (for Addition)

7.
Additive Property of Equality

8.
Multiplicative Property of Equality

9.
Substitution Property

10.
Symmetric Property or Property of Symmetry

11.

$5x - 6 = 14$	Given
A) $+6 \quad +6$	A) Addition Property of Equality
$5x = 20$	
B) $(\frac{1}{5})(5x) = (\frac{1}{5})(20)$	B) Multiplication Property of Equality
$x = 4$	

12.

$11 = \frac{1}{3}x + 8$	Given
A) $-8 \quad -8$	A) Addition Property of Equality
$3 = \frac{1}{3}x$	
B) $(3)(3) = (3)(\frac{1}{3}x)$	B) Multiplication Property of Equality
$9 = x$	
C) $x = 9$	C) Property of Symmetry

Practice 2

1.
Inverse Property (of Multiplication)

2.
Associative Property of Addition

3.
Commutative Property of Addition

4.
Inverse Property of Addition (additive inverse)

5.
Identity Property of Multiplication

6.
Distributive Property

7.
The Multiplication Property of Equality

8.
Substitution Property

9.
Symmetric Property or Property of Symmetry

10.
Addition Property of Equality

11.

$4(x + 7) = -3$	Given
A) $4x + 28 = -3$	A) Distributive Property
B) $-28 \quad -28$	B) Addition Property of Equality
$4x = -31$	
C) $(\frac{1}{4})(4x) = (\frac{1}{4})(-31)$	C) Multiplication Property of Equality
$x = -\frac{31}{4}$	

12.

$-\frac{1}{6}x = 12$	Given
A) $(-6)(-\frac{1}{6}x) = (-6)(12)$	A) Multiplication Property of Equality
$x = -72$	
check: B) $-\frac{1}{6}(-72) = 12$	B) Substitution Property
C) $12 = 12$	C) Reflexive Property

Targeted Review

1.
$|-6|-|4| = 6-4 = 2$

2.
$|-6-4| = |-10| = 10$

3.
$\frac{4}{5}+\frac{2}{3}$ LCD = 15, $\frac{12}{15}+\frac{10}{15} = \frac{22}{15}$

4.
$\frac{1}{8}+\frac{2}{5}-\frac{1}{10}$ LCD = 40, $\frac{5}{40}+\frac{16}{40}-\frac{4}{40} = \frac{17}{40}$

5.
$-\frac{3}{4}+\frac{2}{3}$ LCD = 12, $-\frac{9}{12}+\frac{8}{12} = -\frac{1}{12}$

6.
$\frac{12}{5}-\frac{2}{3}-\frac{1}{2}$ LCD = 30, $\frac{72}{30}-\frac{20}{30}-\frac{15}{30} = \frac{37}{30}$

7.
$\sqrt{81} = 9$

8.
$\sqrt{25} = 5$

9.
$|-8|+2(6)(\frac{1}{4})-(\sqrt{25}\div\frac{1}{5})$
$8+12(\frac{1}{4})-(5\div\frac{1}{5})$
$8+3-(5\cdot\frac{5}{1})$
$8+3-25$
-14

10.
$9(\frac{2}{3})-|5-11|+(-3)(13)$
$6-|-6|+(-39)$
$6-6-39$
-39

11.
$\frac{1}{5}x = -8$
$(5)\frac{1}{5}x = (5)(-8)$
$x = -40$

12.

$$12 - x = -3$$
$$12 + (-12) - x = -3 + (-12)$$
$$-x = -15$$
$$\frac{-x}{-1} = \frac{-15}{-1}$$
$$x = 15$$

13.

$$\frac{x}{2} + 6 = -5$$
$$\frac{x}{2} + 6 + (-6) = -5 + (-6)$$
$$\frac{x}{2}(2) = (-11)(2)$$
$$x = -22$$

14.

$$4x - 3 = 7$$
$$4x - 3 + 3 = 7 + 3$$
$$4x(\frac{1}{4}) = 10(\frac{1}{4})$$
$$x = \frac{10}{4} = \frac{5}{2}$$

15. D

$2c^2 - c$

$2(-3)^2 - (-3)$

$2(9) + 3$

$18 + 3$

21

A) -15 (This happens when you write the square of -3 as -9, rather than 9.)

B) -9 (This happens when you double -3 rather than squaring it.)

C) 15 (This happens when you ignore the subtraction sign in the expression.)

D) 21

16.

☑ $x + 4x$

$x + 5$ (These are not like terms and cannot be combined.)

☑ $2x + 3x$

☑ $10x - 5x$