

## Algebra Development 3.2

## KEY

## Algebra 2

State the property of real numbers illustrated in each problem.

1)  $a + 0 = a$

Additive Identity

2)  $5 + d + 0 = 5 + d$

3)  $(j/k)(k/j) = 1$

Multiplicative Inverse

4)  $(1/7)7 = 1$

5)  $2 + (q + 5) = (q + 5) + 2$

Commutative Property  
of Addition

6)  $4 + (w + 7) = (4 + w) + 7$

Associative Property of  
Addition

7)  $(8 - 2)9 = 8(9) - 2(9)$

Distributive Property

8)  $r + (-r) = 0$

Additive Inverse

9)  $v(w) = w(v)$

Commutative Property  
Of Multiplication

10)  $3(4 \times 5) = (4 \times 5)3$

Simplify the following expressions.

11)  $\left(\frac{39}{65}\right)^4$

$\left(\frac{3}{5}\right)^4$

$\frac{81}{625}$

12)  $\left(\frac{12}{60}\right)^2$

$\frac{1}{25}$

13)  $\left(\frac{12 + 7^2 - 13}{(36 \div 9)^2}\right)^3$

$\left(\frac{(12 + 49 - 13)}{(4)^2}\right)^3$

$\left(\frac{48}{16}\right)^3 = 3^3$

27

14)  $\sqrt{\frac{24}{25}}$

$\frac{\sqrt{4 \cdot 6}}{5}$

$\frac{2\sqrt{6}}{5}$

15)  $\sqrt{\frac{32}{121}}$

$\frac{4\sqrt{2}}{11}$

16)  $\sqrt{\frac{18}{5}}$

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

$\frac{3\sqrt{10}}{5}$

17)  $\sqrt{\frac{4}{75}}$

$\frac{2\sqrt{3}}{15}$

18)  $\sqrt{\frac{27}{8}}$

$\frac{3\sqrt{6}}{4}$

19)  $\sqrt{\frac{147}{20}}$

$\frac{7\sqrt{15}}{10}$

20)  $\sqrt[3]{\frac{16}{50}}$

$\sqrt[3]{\frac{8}{25}} = \frac{2}{\sqrt[3]{25}}$

$\frac{2\sqrt[3]{5}}{5}$

Simplify.

21)  $\sqrt{-36}$

$\sqrt{36 \cdot (-1)}$

6i

22)  $\sqrt{-121}$

11i

23)  $\sqrt{-27}$

$\sqrt{9 \cdot 3 \cdot (-1)}$

 $3i\sqrt{3}$ 

24)  $\sqrt{-17}$

$i\sqrt{17}$

25)  $\sqrt{-z^2}$

iz

26)  $\sqrt{-c^5}$

$$\frac{\sqrt{c^4 \cdot c \cdot (-1)}}{ic^2 \sqrt{c}}$$

27)  $\sqrt{-4w^9}$

$$2iw^4 \sqrt{w}$$

28)  $\sqrt{-8q^2}$

$$2ig\sqrt{2}$$

29)  $\sqrt{-48j^2k^7}$

$$4ijk^3 \sqrt{3k}$$

30)  $\sqrt{-21ab}$

$$i\sqrt{21ab}$$

Identify the sets of complex numbers to which each of the following belongs.

31) -13  
C, R, Q, Z

32) 7i  
C, Imaginary,  
Pure Imaginary

33) 4 - 2i  
C, Imaginary, Not  
Pure Imaginary

34)  $\sqrt{3}$   
C, R, I

35) -4 + 0i  
C, R, Q, Z

36) .925  
C, R, Q

37)  $\sqrt{9}$   
C, R, Q, Z, W, N

38) 0 - 8i  
C, Imaginary,  
Pure Imaginary

39) 17/31  
C, R, I

40)  $\sqrt{-4}$   
C, Imaginary  
Pure Imaginary

Simplify.

41)  $7i + 14i - 10i$   
3i

42)  $2 + 3i + 3$   
5 + 3i

43)  $(7 - i) + (2 + 6i)$   
9 + 5i

44)  $(5 + 3i) - (-2 + i)$   
7 - 4i

45)  $(14 - 3i) - (-4 - 7i)$   
18 + 4i

46)  $12i - 2 + 7 - 4i$   
8i + 5

47)  $(4 + 6i + 2i) - (3 + 8i)$   
4 + 8i - 3 - 8i  
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