

Math 1021 – Beginning of the Semester Review

In 1 – 3, fill in the blanks to make each statement true.

1. The property $a + b = b + a$ is called the _____ of addition, and $(a + b) + c = a + (b + c)$ is called the _____ property.
2. The additive inverse of -3 is _____, and the multiplicative inverse of $1/3$ is _____.
3. The additive inverse of 0 is _____, that is, $-0 =$ _____; the multiplicative inverse of 1 is _____, that is, $1^{-1} =$ _____.

Evaluate each expression in 4 – 5.

4. (a) $(48 \div 3)[(6 + 12) \div (4 - 2)]$
(b) $48 \div \{3[6 + 12 \div (4 - 2)]\}$
(c) $48 \div 3[6 + 12 \div 4 - 2]$
(d) $48 \div 3 \cdot 6 + 12 \div 4 - 2$
5. (a) $8 \cdot [(18 + 9) \div (3 \cdot 3)]$
(b) $8 \cdot [18 + 9 \div (3 \cdot 3)]$
(c) $8 \cdot [18 + 9 \div 3 \cdot 3]$
(d) $8 \cdot 18 + 9 \div 3 \cdot 3$

In 6 – 9, fill in the blanks to make each statement true.

6. To compute $a + b$ when a and b are unequal and have opposite signs, we _____.
7. When there is a minus sign before parentheses, the parentheses can be removed by _____ of each term inside the parentheses.
8. The subtraction $a - b$ is equal to the addition _____.
9. The division a/b is equal to the multiplication _____.

In 10 – 15, evaluate each of the following.

10. $-7 + (-2)$
11. $-4 + (-4)$
12. $5 - (-8)$
13. $3 + (-8)$
14. $(-3)(-5)$
15. $\frac{24}{-6}$

In 16 – 20, express each of the following without parentheses or brackets.

16. $-(-x-7)$

17. $-(6-y)$

18. $-[-(-x)-(-y)]$

19. $(-4)b$

20. $[-(-5)](-y)$

21. Express each of the following as a product of a power of 2 by a power of 3.

(a) $2^3 \cdot 3^2 \cdot 6$

(b) $4 \cdot 6 \cdot 12 \cdot 6$

(c) $18^2 \cdot 24^3$

In 22 – 28, simplify each of the following. **Express answers in terms of positive exponents.**

22. $(2^2)^4$

23. $7^2 \cdot 7^3 \cdot 7^5$

24. $(-5)(-5)^2(-5)^3$

25. $x^2 \cdot x \cdot x^3 \cdot x \cdot x^4 \cdot x$

26. $[(4^2)^3]^4$

27. $(2ab)^6$

28. $(a^2b)^5(ac)^3(b^2c^3)^{-4}(ab)^2$

In 29 – 30, accompany each of the following with an appropriate diagram.

29. On a coordinate plane, locate and clearly label each of the following points.

(a) $(5, 2)$

(b) $(-4, 3)$

(c) $(-6, -5)$

(d) $(5, -8)$

30. If $a < 0$ and $b > 0$, determine the quadrant of each of the following points.

(a) (a, b)

(b) $(-a, b)$

(c) $(a, -b)$

(d) $(-a, -b)$

31. Find two points P_1 and P_2 such that P_1 , P_2 , $(-4, -2)$, and $(5, 3)$ are the vertices of a rectangle whose sides are parallel to the coordinate axes.

32. Add.

(a) $\frac{13}{15} + \frac{3}{15}$

(b) $\frac{3}{10} + \frac{8}{15}$

(c) $\frac{5x}{3x+1} + \frac{4x}{3x+1}$

(d) $\frac{4}{t} + \frac{6}{t+2}$

(e) $\frac{4}{x^2-16} + \frac{x+2}{x^2+4x}$

33. Subtract.

$$(a) \frac{12}{5} - \frac{2}{5} \quad (b) \frac{11}{12} - \frac{3}{8} \quad (c) \frac{3b}{3b+2} - \frac{4b}{3b+2}$$
$$(d) \frac{4}{k} - \frac{6}{k+2} \quad (e) \frac{x}{4x+16} - \frac{4}{x^2+4x}$$

34. Multiply and simplify.

$$(a) \frac{15}{16} \cdot \frac{8}{5} \quad (b) \frac{15}{4} \cdot \frac{3}{4} \quad (c) \frac{3m^2n}{9x^2y} \cdot \frac{27x^4y^3}{6mn} \quad (d) \frac{8x^2-4x}{2x^2+5x-3} \cdot \frac{x^2-9}{2x}$$

35. Divide and simplify.

$$(a) \frac{3}{4} \div \frac{3}{7} \quad (b) \frac{1}{20} \div \frac{1}{5} \quad (c) \frac{12x^5y^4}{7a^3b^2} \div \frac{4x^2y}{21a^2b} \quad (d) \frac{x+3}{x-3} \div \frac{x^2+6x+9}{x^2-6x+9}$$

36. Combine like terms.

$$(a) -8 + 11a - 5b + 6a - 7b - 7 \quad (b) 8x - 5x + 6 + 3y - 2y - 4$$

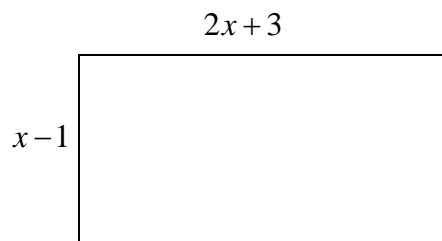
37. Find the slope, x - and y -intercepts of the following equations.

$$(a) y = 2x + 1 \quad (b) 2x + 3y = 6$$

38. Solve the following equations.

$$(a) 7x + 7 = -14$$
$$(b) (z+5) - 7 = (z-7) + 5$$
$$(c) -(y+5) - (2+7y) + 8y = 3y - 8$$
$$(d) -8b + 6 + 6b = -3b + 11 + b$$

39. Write an expression for the area of the figure shown.



40. Write an expression for the difference of 4 and the quotient of x and 6.

41. Check to see if -1 is a solution of the equation, $3x^2 - 2x = -5x$.

42. Solve the following inequalities:

(a) $-13 + x > -12$

(b) $-3(4 - 2x) \leq 18$

(c) $-4 < 2x + 5 < 19$

43. Write the equation of the line using the information given in the indicated form.

(a) $m = \frac{1}{4}$; y -intercept is -3 ; slope-intercept form

(b) $m = -\frac{3}{7}$; y -intercept $(0,5)$; general form

(c) Through the points $(2,-6)$ and $(-3,-5)$; slope-intercept form

(d) Through the points $(3,2)$ and $(4,5)$; general form

44. Factor completely the following polynomials:

(a) $x^2 - 12x + 35$

(b) $2y^3 - 22y^2 + 48y$

(c) $6y - 18$

(d) $x^2 - 81$

(e) $4x^2y^3 - 12x^3y^2$

(f) $10a^2 - 19a + 6$

(g) $-4x^2 + 64$

(h) $3x(6x - 5) - 4(6x - 5)$

45. Combine the following polynomials and simplify:

(a) $(3x^2 - 8x + 2) + (4x^2 - 2x - 9)$

(b) $(-5x^2 + 7x - 9) - (-2x^2 - 8x + 6)$

(c) $-3x^3(2x^4 + 5x - 7)$

(d) $(3x - 5)(4x + 7)$

(e) $(7x - 4)^2$

(f) $\left(\frac{1}{7}x^8\right)\left(-\frac{1}{4}x^2\right)$