

1.1 - 1.4 Review (non calculator)

Name Key
Period

Pre-Calc

State the property of real numbers being used.

1. $3x + 2y = 2y + 3x$

2. $(a + b)(a - b) = (a - b)(a + b)$

3. $4(a + b) = 4a + 4b$

Commutative

commutative

distributive

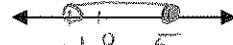
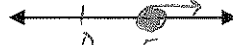
Write the interval in a different notation and graph.

4. $[-2, 6)$ $-2 \leq x < 6$

5. $(-\infty, 4]$ $-\infty < x \leq 4$

6. $x \geq 5$ $[5, \infty)$

7. $-1 < x \leq 5$ $(-1, 5]$



Evaluate the expression.

8. $1 - |1 - |-1||$
1

9. $2^{-3} - 3^{-2}$
 $\frac{1}{72}$

10. $216^{-2/3}$
 $\frac{1}{36}$

11. $\frac{\sqrt{242}}{\sqrt{2}}$
11

12. $2^{1/2} 8^{1/2}$
4

13. $\sqrt{2} \sqrt{50}$
10

Simplify the expression

14. $\frac{x^2(2x)^4}{x^3}$
 $16x^3$

15. $(a^2)^{-3}(a^3b)^2(b^3)^4$
 b^{14}

16. $(3xy^2)^3(\frac{2}{3}x^{-1}y)^2$
 $12xy^8$

17. $(\frac{r^2s^{4/3}}{r^{1/3}s})^6$
 $r^{10}s^2$

18. $\sqrt[3]{(x^3y)^2y^4}$
 x^2y^2

19. $\sqrt[3]{96} + \sqrt[3]{3}$
 $3\sqrt[3]{3}$

20. $(\frac{9x^3y}{y^{-3}})^{1/2}$
 $3x^{3/2}y^2$

21. $(\frac{x^{-2}y^3}{x^2y})^{-1/2}(\frac{x^3y}{y^{1/2}})^2$
 x^8

Rationalize the Denominator

22. A) $\frac{2}{\sqrt[3]{2x}}$
 $\frac{\sqrt[3]{4x^2}}{x}$

B) $\frac{x}{\sqrt[3]{y^2}}$
 $\frac{x\sqrt[3]{y^3}}{y}$

Find the domain of the expression.

23. $\frac{t^3 - 1}{t^2 - 1}$
 $x \neq \pm 1$

24. $\frac{\cancel{x^2+5} \sqrt{x^2+5x+6}}{\sqrt{x+5}}$
 $x > -5$

Factor the expression completely.

25. $12x^2y^4 - 3xy^5 + 9x^3y^2$
 $3xy^2(4xy^2 - y^3 + 3x^2)$

26. $25 - 16t^2$
 $(5 - 4t)(5 + 4t)$

27. $4t^2 - 13t - 12$
 $(4t + 3)(t - 4)$

28. $x^4 - 2x^2 + 1$
 $(x-1)(x+1)(x-1)(x+1)$

29. $3(x+2)^2 + 14(x+2) + 8$
 $(3x+8)(x+6)$

30. $2y^6 - 32y^2$
 $2y^2(y-2)(y+2)(y^2+4)$

31. $x^6 - 1$
 $(x-1)(x+1)(x^4+x^2+1)$

32. $y^3 - 2y^2 - y + 2$
 $(y-1)(y+1)(y-2)$

33. $8x^3 + y^6$
 $(2x+y^2)(4x^2-2xy^2+y^4)$

Perform the indicated operations and simplify.

34. $(1+x)(2-x) - (3-x)(3+x)$

$$x - 7$$

35. $\sqrt{x}(\sqrt{x}+1)(2\sqrt{x}-1)$

$$2x\sqrt{x} + x - \sqrt{x}$$

36. $x^2(x-2) + x(x-2)^2$

$$2x^3 - 6x^2 + 4x$$

37. $\frac{t^3-1}{t^2-1}$

$$\frac{t^2+t+1}{t+1}$$

38. $\frac{x^2+2x-3}{x^2+8x+16} \cdot \frac{3x+12}{x-1}$

$$\frac{3(x+3)}{x+4}$$

39. $\frac{x^2-x-12}{8x^2} \div \frac{x^3+3x^2}{8x^3-2x^2} \div \frac{4x-1}{x+2}$

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

40. $2 + \frac{x}{x+3}$

$$\frac{3x+6}{x+3}$$

41. $\frac{1}{x+5} + \frac{2}{x-3}$

$$\frac{3x+7}{(x+5)(x-3)}$$

42. $\frac{1}{x+1} - \frac{1}{x+2}$

$$\frac{1}{(x+1)(x+2)}$$

43. $\frac{1}{x^2} + \frac{1}{x^2+x}$

$$\frac{2x+1}{x^2(x+1)}$$

44. $\frac{x}{x^2+x-2} - \frac{2}{x^2-5x+4}$

$$\frac{x^2-6x-4}{(x+2)(x-1)(x-4)}$$

45. $\frac{1}{x+1} - \frac{2}{(x+1)^2} + \frac{3}{x^2-1}$

$$\frac{x^2+x+4}{(x+1)^2(x-1)}$$

Simplify the compound fractional expression.

46. $\frac{1 + \frac{1}{c-1}}{1 - \frac{1}{c-1}}$

$$\frac{c}{c-2}$$

47. $\frac{\frac{5}{x-1} - \frac{2}{x+1}}{\frac{x}{x-1} + \frac{1}{x+1}}$

$$\frac{3x+7}{x^2+2x-1}$$

Rationalize the denominator.

48. $\frac{2}{3-\sqrt{5}}$

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

49. $\frac{2(x-y)}{\sqrt{x}-\sqrt{y}}$

$$2\sqrt{x} + 2\sqrt{y}$$

Rationalize the numerator.

50. $\frac{1-\sqrt{5}}{3}$

$$\frac{-4}{3+3\sqrt{5}}$$

51. $\sqrt{x} - \sqrt{x+h}$

$$\frac{-h}{\sqrt{x} + \sqrt{x+h}}$$