

Name \_\_\_\_\_

PreCalculus

Summer Homework 2018-19

**Complete each problem. Label answers when appropriate. Show your work.**

*Use the properties of exponents to simplify each expression*

1.  $(-3ab^4)(4ab^{-3})$  1. \_\_\_\_\_

2.  $(2xy^2)^3$  2. \_\_\_\_\_

3.  $3a(-4a^2)^0$  3. \_\_\_\_\_

4.  $\left(\frac{5x^3}{y}\right)^2$  4. \_\_\_\_\_

*Rewrite each expression with positive exponents.*

5.  $x^{-1}$  5. \_\_\_\_\_

6.  $\frac{1}{3x^{-2}}$  6. \_\_\_\_\_

7.  $\frac{12a^3b^{-4}}{4a^{-2}b}$  7. \_\_\_\_\_

8.  $\left(\frac{3x^2}{y}\right)^{-2}$  8. \_\_\_\_\_

*Simplify each radical.*

9.  $\sqrt{54xy^4}$  9. \_\_\_\_\_

10.  $\sqrt{\frac{32a^4}{b^3}}$

11.  $\sqrt[3]{16x^5}$

10. \_\_\_\_\_

11. \_\_\_\_\_

Write the radical in rational exponent form.

12.  $\sqrt{32}$

13.  $\sqrt[3]{15}$

12. \_\_\_\_\_

13. \_\_\_\_\_

14.  $\sqrt[4]{2^3}$

15.  $\sqrt[3]{2x^{-2}}$

14. \_\_\_\_\_

15. \_\_\_\_\_

Perform the operations and simplify.

16.  $\frac{x^{-3} \cdot x^{1/2}}{x^{3/2} \cdot x^{-1}}$

16. \_\_\_\_\_

17.  $\frac{x^{4/3}y^{2/3}}{(xy)^{1/3}}$

17. \_\_\_\_\_

Rationalize the denominator and simplify.

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

18. \_\_\_\_\_

Simplify each expression.

19.  $2\sqrt{50} + 12\sqrt{8}$

19. \_\_\_\_\_

20.  $11\sqrt{245x^3} - 9\sqrt{45x^3}$

20. \_\_\_\_\_

*Find each product.*

21.  $(5x + 9)(5x - 9)$

21. \_\_\_\_\_

22.  $(3x + 2)^3$

22. \_\_\_\_\_

23.  $(x + y - 2)(x + y + 2)$

23. \_\_\_\_\_

24. Factor:  $3 - 12x^2$

24. \_\_\_\_\_

25. Factor:  $16x^2 - 81$

25. \_\_\_\_\_

26. Factor:  $x^3 + 27$

26. \_\_\_\_\_

27. Factor:  $x^2 - 7x + 12$

27. \_\_\_\_\_

28. Factor:  $2x^2 + x - 15$

28. \_\_\_\_\_

Write each expression in simplest form.

29.  $\frac{x^3 - 4x}{x^2 + x - 2}$

29. \_\_\_\_\_

30.  $\frac{12 + x - x^2}{2x^2 - 9x + 4}$

30. \_\_\_\_\_

Perform the operations and simplify.

31.  $\frac{2x^2 + x - 6}{x^2 + 4x - 5} \cdot \frac{x^3 - 3x^2 + 2x}{4x^2 - 6x}$

31. \_\_\_\_\_

32.  $\frac{x^3 - 8}{x^2 - 4} \div \frac{x^2 + 2x + 4}{x^3 + 8}$

32. \_\_\_\_\_

33.  $\frac{x}{x - 3} - \frac{2}{3x + 4}$

33. \_\_\_\_\_

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

34. \_\_\_\_\_

35. Simplify:  $\frac{\frac{2}{x} - 3}{1 - \frac{x}{x - 1}}$

35. \_\_\_\_\_