

Math 148 "Prerequisite" Skills Homework
Spring 2019

Express (and simplify) each of the following without a negative exponent:

1. $x^5 \cdot x^{-8}$
 $\frac{1}{x^3}$

2. $(2/3)^{-2}$
 $\frac{9}{4}$

3. $2x^{-4} \cdot 3x^{-1}$
 $\frac{6}{x^5}$

4. $(2x^{-2})^3$
 $\frac{8}{x^6}$

5. $(2x^4 y^{-5} z^3)^{-3}$
 $\frac{y^{15}}{8x^{12} z^9}$

6. $8^{2/3} \cdot 9^{-3/2}$
 $\frac{4}{27}$

Multiply

7. $(2x+4)(3x-5)$
 $6x^2 + 2x - 20$

8. $(x^{1/2} + 3)(2x^{-1/2} - 5)$
 $-13 - 5x^{1/2} + \frac{6}{x^{1/2}}$

9. $(2x+1)^3$
 $8x^3 + 12x^2 + 6x + 1$

Factor

10. $12x^2 + x - 6$
 $(3x-2)(4x+3)$

11. $6x^4 y + 21x^3 y^2 - 12x^2 y^3$
 $3x^2 y (2x-4)(x+4y)$

12. $4x^{-3} + 6x^{-1} + 2x$
 $\frac{2(x^2+1)(x^2+2)}{x^3}$

13. $3x^3 - 7x^2 - 12x + 28$
 $(3x-7)(x-2)(x+2)$

14. $5(x-3)^4 (2x+1)^3 + 6(x-3)^5 (2x+1)^2$
 $(x-3)^4 (2x+1)^2 (16x-13)$

15. $8x^3 + 27$
 $(2x+3)(4x^2 - 6x + 9)$

Solve the equations:

16. $\frac{2}{3}x + 5 = \frac{-1}{2}x + \frac{2}{3}$
 $x = \frac{-26}{7}$

17. $\frac{x}{x-1} + \frac{2}{x+3} = \frac{4}{x^2+2x-3}$
 $x = -6$

18. $4x(3x+7)(2x-5)=0$

$$x=0, -\frac{7}{3}, \frac{5}{2}$$

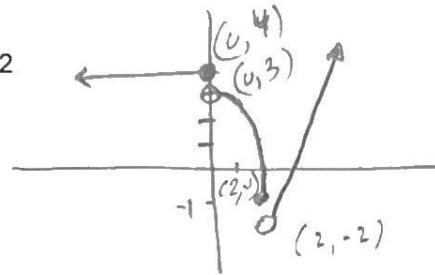
19. $4(x-2)^3(x+3)^3+3(x-2)^4(x+3)^2=0$

$$x=2, -3, -\frac{6}{7}$$

20. Find the domain of the function $f(x) = \frac{\sqrt{x}}{2x-9}$

$$D: [0, \frac{9}{2}) \cup (\frac{9}{2}, \infty)$$

21. Graph the function: $f(x) = \begin{cases} 4 & \text{for } x \leq 0 \\ 3-x^2 & \text{for } 0 < x \leq 2 \\ 2x-6 & \text{for } x > 2 \end{cases}$



22. Find the equation of the line that has slope 4 and contains the point (3, -2).

$$y = 4x - 14$$

23. Find the equation of the line that has slope $-\frac{2}{3}$ and contains the point $(2, \frac{1}{2})$.

$$y = -\frac{2}{3}x + \frac{11}{6}$$

24. Find the equation of the line containing the points (-3, 5) and (3, 1).

$$y = -\frac{2}{3}x + 3$$

25. For the function: $f(x) = 2x^2 - 3x + 5$, find and simplify $\frac{f(x+h)-f(x)}{h}$.

$$4x + 2h - 3$$