

# Homework Set 1

(review topics)

Simplify the following expressions. You may assume each variable represents a non-zero real number.

1.  $\left(\frac{x^{13}}{x^{-3}}\right)^{1/4}$

2.  $(2xy^{-5}z^3)^2(x^{-3}y^2xz^2z)^{-4}$

3.  $\left(\frac{-30x^{14}y^7}{10x^{17}y^{-2}}\right)^{-5}$

4.  $\left(\frac{2x^6y^4}{12x^8z^{-3}}\right)^0$

5.  $\frac{(2x^{-2}y^{-1})^{-2}(16x^{-3}y^4)^{-1}(4x^3y^{-3})^0}{(x^{-3}y^{-5})^2}$

6.  $-6x^3 + 2x^2y + 5x^2 + 4xy - 8x + 9 + 5x^2y - 3xy - (17x^3 - 3x^2 + 2x + 6)$

7.  $(3x - 4)^2$

8.  $(x + 1)^4$

9.  $3\sqrt{54} - 2\sqrt{24} - \sqrt{96} + 4\sqrt{63}$

10.  $\frac{(x+1)(x-2)(x+3)}{(x-2)(x+7)}$

11.  $\frac{x^2-9}{(x-3)(x+4)}$

12.  $\frac{x^3+6x^2+5x}{x^2-x-30}$

For the following questions, determine the equation of the line.

13. The line passes through the points (1, 4) and (-2, 1).

14. The line passes through the points (-1, 2) and (-1, 0).

15. The line passes through the points (1, 0) and (0, 3).

16. The line passes through the point (0, -2) and has an x-intercept of 2.

17. The line passes through the point (1, 1) and is parallel to  $2x - 3y = 15$ .

18. The line passes through the point (-3, 1) and is perpendicular to  $3x + y = 2/7$ .

Find the point of intersection of the two lines if they cross.

19.  $y_1 = x$  and  $y_2 = 4x - 3$

20.  $y_1 = 3x - 3$  and  $y_2 = -\frac{2}{5}x$

Solve the following equations or system of equations for the given unknown(s).

$$21. \begin{cases} 3x + 4y = 0 \\ x - 2y = 1 \end{cases}$$

$$22. \begin{cases} 2x - 3y = 0 \\ 34x - 51y = 17 \end{cases}$$

$$23. \begin{cases} 2x = 3y + 4 \\ 4x = 3 - 5y \end{cases}$$

$$24. \begin{cases} x - y + 3z = 8 \\ 3x + y - 2z = -2 \\ 2x + 4y + z = 0 \end{cases}$$

$$25. \begin{cases} x + z = 3 \\ x + 2y - z = 1 \\ 2x - y + z + w = 4 \\ 3x - z + w = 2 \end{cases}$$