Review for Final Exam

1. Evaluate the expression if $x = -2$ and $y = 6$: $3x - y(3y - x)$
2. Simplify: $\left(\dfrac{x^7 z^4}{x^9 y^0}\right)^{-3}$
3. Divide $(y^3 - 7y + 3) \div (y + 5)$
4. Factor completely:
   (a) $64t^3 - 1$
   (b) $144x^8 - 1$
   (c) $10xy^4 - 90xy^2$
   (d) $x^2 - 4x - 21$
   (e) $3x^2 - x - 14$
5. Simplify: $\dfrac{2x^3}{x^2 - 4x - 12} \bullet \dfrac{x^2 - 36}{10x^4}$
6. Simplify: $\dfrac{4b}{7b - 2} - \dfrac{3b + 2}{2 - 7b}$
7. Simplify: $\dfrac{\dfrac{2}{x} - \dfrac{3}{7x}}{3 + 2x}$
8. Simplify: $5\sqrt{49} - 6\sqrt{7} + 3\sqrt{144} + \sqrt{28} = ?$
9. Simplify: $\dfrac{-12 - \sqrt{18}}{-6}$
10. Rationalize the denominator: $\dfrac{2 + \sqrt{3}}{1 + \sqrt{3}}$
11. Solve for x: $\dfrac{3}{x + 4} - \dfrac{4}{x^2 - x - 20} = \dfrac{7}{x - 5}$
12. Solve for y: $8x - yz = 12y$
13. Find the hypotenuse of a right triangle with legs 5 and 11
14. Evaluate $-16^{-\frac{3}{2}}$
15. Simplify, express with only positive exponents: $\dfrac{y^{\frac{3}{10}}}{y^{-\frac{2}{5}}}$
16. Simplify: $\left(\dfrac{27x^6}{z^{12}}\right)^{\frac{1}{3}}$:
17. Simplify: $\sqrt[5]{243x^{10}y^7z^5}$:

18. Solve for x:

    (a) $x^2 = -4x + 32$
    (b) $10x^2 + 11x - 6 = 0$
    (c) $8x^2 = 40x$
    (d) $x^2 - 10x = 0$
    (e) $3x^2 + 5x - 9 = 0$
    (f) $(x-4)^2 = 9$
    (g) $4(x-1)^2 = 20$

19. By completing the square, one can demonstrate that quadratic equation $x^2 - 8x + 5 = 0$ is equivalent to $(\_\_\_\_\_)^2 = \_\_\_$

20. Express $x \geq -2$ in interval notation.

21. Express $-\frac{1}{2} < x < 5$ in interval notation.

22. Solve for x, express in set, interval, and graph notation:
    $1 - 3(-7 - 2x) + 2 > 4$

23. Solve for x, express in set, interval, and graph notation: $-\frac{3x}{2} - \frac{7}{10} < \frac{1}{5}$

24. Solve for x, express in set, interval, and graph notation: $-3 \leq -5x + 2 \leq 5$

25. Solve for x : $|4x - 2| - 6 = 4$

26. Solve for x : $|2x + 7| + 6 = 4$

27. Solve for x : $|2x - 1| < 4$

28. Find the distance between the points (-1,5) and (3, -3)

29. Find the midpoint between the points (-1,5) and (3, -3)

30. Find the equation of the line containing the point (-3,6) and has slope 0.

31. Find the equation of the line containing the point (-3,6) and has undefined slope.

32. Find the equation of the line containing the points (-1,6) and (10,-2).

33. Find the equation of the line containing the points (-1,6) and (-1,-2).

34. Find the slope and y-intercept of the line $2x - 3y = -9$.

35. Find the equation of the line perpendicular to the $y = 3x + 4$ and containing the point $(1, -2)$.

36. Find the equation of the line containing the point (-1,4) and parallel to $2x - 3y = -9$.

37. Find the center and radius of the circle, $x^2 + y^2 - 6y - 9 = 0$.

38. What is the solution of the following system of linear equations?
$3x - y = -1$
$2x - 4y = 9$?

39. What is the **x**-value of the solution of the system of linear equations?
$3x - 7y = 6$
$2x + y = -19$?

Solutions to Review for Final exam

1. -126
2. $\frac{x^6}{z^{12}}$
3. $y^2 - 5y + 18R - 87$
4. (a) $(4t-1)(16t^2+4t+1)$
   (b) $(12x^4-1)(12x^4+1)$
   (c) $10xy^2(y+3)(y-3)$
   (d) $(x-7)(x+3)$
   (e) $(3x-7)(x+2)$
5. $\dfrac{x+6}{5x(x+2}$
6. $\dfrac{7b+2}{7b-2}$
7. $\dfrac{11}{7x(3+2x)}$
8. $71 - 4\sqrt{7}$
9. $\frac{4+\sqrt{2}}{2}$
10. $\frac{5-\sqrt{3}}{-2}$
11. $x = -\frac{47}{4}$
12. $y = \dfrac{8x}{12+z}$
13. $\sqrt{146}$
14. $-\frac{1}{64}$
15. $y^{\frac{7}{10}}$
16. $\frac{3x^2}{z^4}$
17. $3x^2yz\sqrt[5]{y^2}$
18. (a) $x = -8,\ x = 4$
    (b) $x = -\frac{3}{2},\ x = \frac{2}{5}$
    (c) $x = 0,\ x = 5$
    (d) $x = 0,\ x = 10$
    (e) $x = -\frac{5\pm\sqrt{133}}{6}$
    (f) $x = -1,\ x = 7$
    (g) $x = 1 \pm \sqrt{5}$
19. $(x-4)^2 = 11$
20. $[-2, \infty)$
21. $(-\frac{1}{2}, 5)$
22. $\{x|x > -\frac{10}{3}\}, (-\frac{10}{3}, \infty),$
23. $\{x|x > -\frac{3}{5}\}, (-\frac{3}{5}, \infty)$
24. $\{x| -\frac{3}{5} \leq x \leq 1\}, [-\frac{3}{5}, 1]$
25. $x = 3, x = -2$
26. no solution
27. $(-\frac{3}{2}, \frac{5}{2})$
28. $4\sqrt{5}$
29. $(1, 1)$
30. $y = 6$
31. $x = -3$
32. $y = -\frac{8}{11}x + \frac{58}{11}$
33. $x = -1$
34. $m = \frac{2}{3},\ b = 3$
35. $y = -\frac{1}{3}x + \frac{5}{3}$
36. $y = \frac{2}{3}x + \frac{14}{3}$
37. $C = (0, 5), r = \sqrt{33}$
38. $(-\frac{4}{5}, -\frac{7}{5})$
39. $x = -\frac{127}{17}$