

Final Exam Review

I usually put between 25 and 30 problems on the final. The final is optional and you may skip the final if you are happy with your grade after taking the chapter 7 test.

#1-2: Simplify

1) $(4x^3y)^3$ 2) $(2xy^2)^4(3x^4y^2)^2$

3) Simplify the expression. Write the answer with positive exponents only. $\frac{24xy^3}{36x^{-4}y}$

4) Subtract $\left(\frac{1}{2}x + \frac{2}{3}\right) - \left(\frac{3}{4}x + \frac{4}{3}\right)$

#5-6: Multiply

5) $(3x + 2)^2$ 6) $(5x + 2y)(3x - 2y)$

7-12: Completely factor the polynomial. State if a polynomial is prime.

7) $x^2 + 7x - 18$

8) $6x^2 + 13x + 5$

9) $9n^2 + 24n + 15$

10) $25b^2 - 81$

11) $x^3 + 125$

12) $-3x^3 - 21x^2 + 54x$

13-16: Solve each equation.

13) $2x(x - 3) = 0$

14) $x^2 - 3x - 10 = 0$

15) $5x^2 + 16x + 3 = 0$

16) $x(x - 1) = 20$

#17-18: Write the domain of the expression using words and in interval notation.

17) $\frac{3}{h-5}$

18) $\frac{y-4}{y^2+5y+6}$

#19-20: Reduce the expression to lowest terms.

19) $\frac{x^2-9}{x^2+5x+6}$

20) $\frac{2y^2+y-6}{y^2+y-2}$

#21-22: Multiply or divide as indicated.

21) $\frac{x^2-9}{3x+4} \cdot \frac{9x^2-16}{x^2+6x+9}$

22) $\frac{5y}{4y-12} \div \frac{10y^2}{6y-18}$

#23-24: Add or subtract the expressions with unlike denominators, simplify as much as possible.

23) $\frac{2}{m-4} - \frac{m-2}{m^2-16}$

24) $\frac{2}{b^2+5b+4} + \frac{6}{b^2-16}$

#25-26: Solve the rational equations. Be sure to check all solutions. If a solution does not check state that it is extraneous.

25) $\frac{x}{x-2} + \frac{1}{x+4} = \frac{x-8}{x-2}$

26) $\frac{x}{3} + \frac{1}{x} = \frac{7}{6}$

27) One person runs 1 mile per hour slower than another. The faster runner can cover 20 miles in the same time the other can run 16 miles. Find the speed of each runner.

28) Multiply, then simplify $\sqrt[4]{a^5b} \cdot \sqrt[4]{a^7b^{11}}$

29) Add. $5\sqrt{18} + 3\sqrt{50}$

30) Multiply, then simplify. $(5\sqrt{3} + 6\sqrt{2})(4\sqrt{3} - \sqrt{2})$

#31-32: Solve the radical equation if possible.

31) $\sqrt{2 - 5x} = 8$

32) $\sqrt{2x - 3} = x - 3$

33) Solve by the square root property. $(t+5)^2 = -18$

34) Solve the equation using the quadratic formula. $5x^2 - 14x - 3 = 0$

35-36: Solve

35) $p + 3\sqrt{p} = 4$

36) $(x-3)^2 - (x-3) - 6 = 0$

37. Find the vertex and axis of symmetry then sketch a graph of the parabola. $y = (x-2)^2 + 3$

38. Find the vertex and sketch a graph. $y = x^2 + 6x + 10$

#39 - 43: Solve the exponential equation by writing each side of the equation with the same base then equating the exponents.

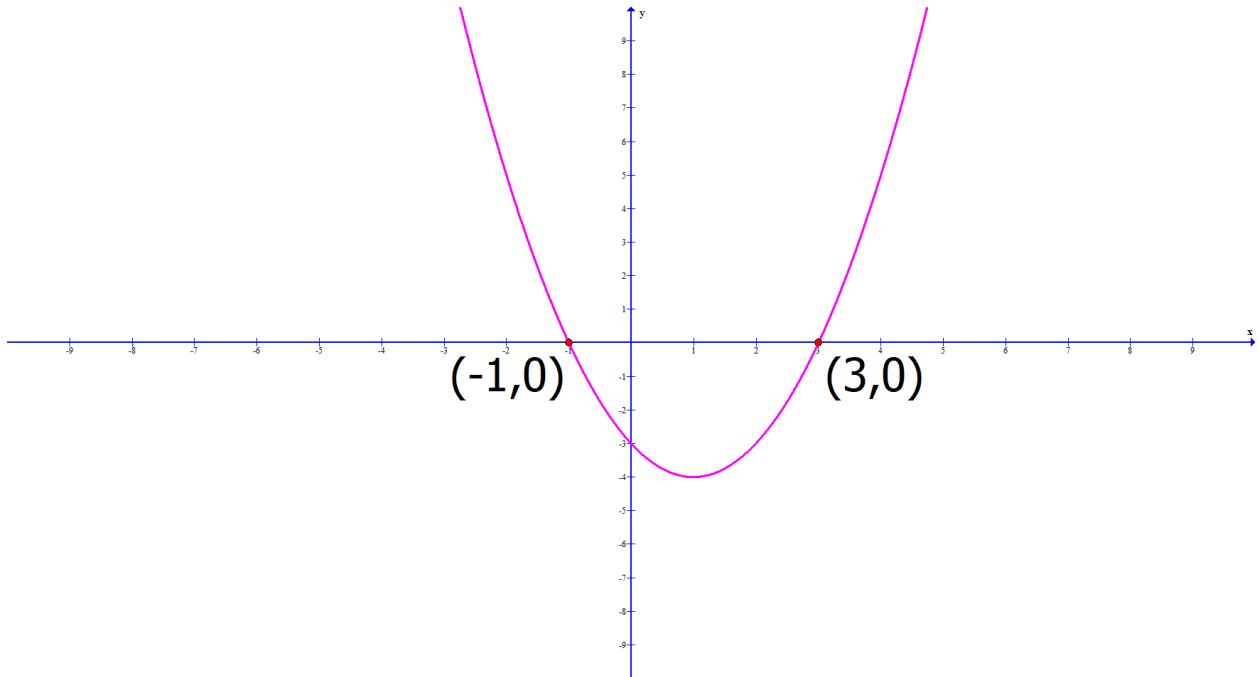
39) $2^{x+5} = 16$

40) $125^{x-4} = 5$

41) $\left(\frac{1}{5}\right)^{3x-1} = 25$

42) $27^{x-4} = 9^x$

43) Use the graph of $f(x)$ to solve: a) $f(x) = 0$ b) $f(x) > 0$ c) $f(x) < 0$ d) $f(x) \geq 0$ e) $f(x) \leq 0$



44) Solve by completing the square by following the indicated steps.

$$x^2 + 6x = 15$$

- Find a value of C to add to each side of the equation.
- Rewrite the equation by the correct value of C to each side.
- Factor the left side and simplify the right side of the equation.
- Solve by applying the square root property.