Math 107 online practice test 1

1. *Simplify:* (a) $(12x^4 - 5x^3 + 4x^2 + 17x - 6) + (13x^3 - 26x^2 + 29x + 1)$
   (b) $(8x^4 - 5x^2 + 7x - 3) - (6x^4 - 7x^3 + 12x^2 + 31x + 14)$

2. *Multiply:* $(4x^2 + 2x - 4)(4x^2 + 7x)$

3. *Multiply:* (a) $(4x + 9)(2x - 8)$ (b) $(3x + 1)(2x - 12)$

4. *Multiply:* (a) $(x - 2)^2$ (b) $(x + 5)^3$

5. *Multiply:* (a) $(A - B)^2$ (b) $(A + B)^3$

6. *Factor:* (a) $7x^4 + 14x^3 - 7x$ (b) $6x^2 - 12x - 5x + 10$

7. *Factor:* (a) $x^2 - 64$ (b) $x^2 + 36$

8. *Factor:* (a) $x^2 - 8x - 20$ (b) $15x^2 + x - 2$

9. *Factor:* (a) $6x^2 + 13x - 5$ (b) $8x^2 - 22x + 12$

10. *Factor:* (a) $x^3 + a^3$ (b) $x^3 - 125$

11. Multiply: $\frac{x^2 - 6x - 16}{x^2 - 64} \cdot \frac{x^2 + x - 2}{x^2 + 4x + 4}$

12. Subtract: $\frac{x - 3}{x^2 - 5x + 4} - \frac{9}{x^2 - 16}$

13. *Simplify:* $5(3x - 9) - 3(5x - 6)$

14. For the expression $5(3x - 9) - 3(5x - 6)$:
a) Evaluate the expression for x = -2.
b) What is the difference in the value of the expression evaluated for x = -2 and x = -3?

15. Explain what is meant by: (a) i (b) a complex number

16. *Simplify:* *(a)* i^2 *(b)* i^8 *(c)* i^{-2} *(d)* i^{446}

17. *Simplify:* *(a)* $(8 - 5i) + (9 - 5i)$ ` *(b)* $(8 - 5i) - (9 - 5i)$

18. *Simplify:* *(a)* $(8 - 5i)(9 - 5i)$ *(b)* $(8 - 5i)^2$

19. *Divide:* $(8 - 5i) \div (9 - 5i)$

20. *Solve:* $3(x + 5)(x - 1) = (3x + 4)(x - 2)$

21. *Solve:* $\frac{4}{x-1} + 3 = \frac{4}{x-1}$

22. *Solve:* $\left|\frac{x+3}{4}\right| = 6$

23. *Solve for f_1:* $\frac{w_1}{w_2} = \frac{f_2 - f}{f - f_1}$

24. *Solve by completing the square:* $x^2 - 6x + 10 = 0$

25. *Solve:* $3x^2 - 5x + 4 = 0$