

Math 155 Post-Test

1. State the transformation. $h(x) = -\frac{2}{3}f(-4x+3)+1$
2. Solve the equation within $[0, 2\pi)$. $\cos \theta - 1 = \cos 2\theta$
3. Find the equation of ellipse with given information.
Foci: $(7, -2)$ $(-1, -2)$ and major axis length is 16.
$$x - 2y + 3z = 7$$
4. Solve by Gauss-Jordan Elimination. $2x + y + z = 4$
 $-3x + 2y - 2z = -10$
5. Solve the equation within $[0, 2\pi)$. $\sec^2 \theta \tan \theta = 2 \tan \theta$
6. Find the n^{th} term of the arithmetic sequence. $a_4 = 47, a_8 = -5$
7. Find the infinite sum if it exists. $16 + \frac{16}{5} + \frac{16}{25} + \dots$
8. Find 10th term of binomial expansion. $\left(\frac{3}{2}x - \frac{2}{3}y\right)^{18}$
9. Solve the triangle by finding missing parts. $a = 0.48, b = 0.63, c = 0.75$
10. Find 175th partial sum of arithmetic sequence. $-18, -12, -6, 0, 6, \dots$
11. Prove by mathematical induction. $0 + 8 + 22 + 42 + \dots + (3n^2 - n - 2) = n(n+2)(n-1)$
12. A radiator contains 8 ounces, 40% of which is antifreeze. How much fluid should be drained and replaced with pure antifreeze so that the new mixture is 60%?
13. Find the difference quotient of $f(x) = 4x^2 - 9x + 5$ $\frac{f(x+h) - f(x)}{h}$
14. Find $(f \circ g)(x)$ and its domain if $f(x) = 4x^2 - 5$ and $g(x) = \sqrt{3x-1}$
15. Decompose to partial fractions. $\frac{x-3}{x^3+3x}$
16. Find all rational zeros using rational root tests. $2x^4 + 7x^3 - 10x^2 - 33x + 18 = 0$

17. Prove the identity. $\frac{1}{1-\sin x} + \frac{1}{1+\sin x} = 2\sec^2 x$

18. Solve the equation algebraically. $\sqrt{x-3} + \sqrt{x+5} = 4$

19. A developer borrows \$150,000 at 6.5% interest, compounded quarterly, and agrees to pay off the loan in 4 years. How much interest will she owe? $A = P\left(1 + \frac{r}{n}\right)^{nt}$

20. Solve the equation algebraically. $\ln x + \ln(x+1) = \ln 3 + \ln 4$

21. Find the equation with degree 4 polynomial with real coefficients. Zeros are $4-3i$, 2 , -3

22. Find all solutions using synthetic division if one solution is $-2+3i$. $x^3 + 7x^2 + 25x + 39 = 0$

23. Solve the triangle by finding missing parts. $B = 14^\circ 20'$, $C = 75^\circ 40'$, $b = 2.72$ ft.

24. Decompose into partial fractions. $\frac{6x^2 - 15x + 16}{x^3 - 3x^2 + 4x}$