

## Sample of Material from MAT136 at Broome Community College

*This material is for sample purposes only and is not to be considered as an official listing of topics.*

1. Reduce the following.

a)  $(\sqrt[5]{xy})^3 \left( \frac{x}{y^{10}} \right)^2$

b)  $\frac{\frac{2}{x^2} + \frac{1}{4}}{\frac{3}{x} - \frac{1}{2}}$

c)  $\frac{2x^2 - 14x + 24}{x^3 - 2x^2 - 8x} \times \frac{x^3 + 3x^2 + 2x}{2x^2 - 2x - 4}$

2. Use the quadratic formula to give the solution(s) to  $3x^2 - 7x - 11 = 0$ . Write your answer in radical notation.

3. Find the inverse function for  $f(x) = \sqrt{\frac{2x^5 + 3}{7}}$ .

4. Prove the identity:  $\sin 2\theta \csc^2 \theta \sin \theta = \frac{2}{\sec \theta}$ .

5. Evaluate the following on your calculator. Round answers to 4 decimal places.

a)  $\sin\left(\frac{\pi}{4}\right)$

b)  $\sec 32^\circ$

c)  $\tan 83^\circ$

d)  $\cot\left(\frac{5\pi}{6}\right)$

6. Convert the following angles as indicated.

a)  $80^\circ =$  \_\_\_\_\_ radians

b) \_\_\_\_\_  $^\circ = \frac{7\pi}{8}$  radians

7. Find the roots for  $y = x^4 - 7x^3 - 157x^2 + 1255x - 1092$ .

8. Solve:  $|2x - 5| = |3x + 11|$ .

9. Sketch  $y = 2 \sin(5x + \pi/2) - 1$ .

10. Graph the two functions  $f(x) = \ln(x + 4)$  and  $f(x) = 2\sin x$  on  $x: [-3, 3]$  and  $y: [-5, 5]$ . Be accurate. Then solve:  $x^2 + 2x - 3 = x^3 + 3$  using ISECT. Circle where the answer is on your graph. (Hint: there are two solutions.)

11. Draw the vertical asymptote(s) for  $f(x) = \frac{1 - 4x}{x + 2}$  and use other points to plot the graph.

12. Solve the following system of equations.

$$4x + 7y - 4z = -95$$

$$2x - 5y - 5z = -16$$

$$-x + \quad + 3z = 38$$

13. Solve:

a)  $5 \cos x \sin x - 3 \sin x = 0$

b)  $4\sqrt{x+8} = 7$

c)  $4^{2x-1} - 3 = 61$

d)  $\log_2 x + \log_2 (x-2) = 3$

e)  $\frac{4}{x-3} = \frac{5}{x+3}$

14. Wanda stands on top of a 50-foot tall building and sees the front door to the building next door at an angle of depression of  $48^\circ$ . How far (to the nearest foot) is she from the front door?

15. A 45-foot tall building casts an 18-foot long shadow. What is the angle of elevation (to the nearest degree) of the sun?