Algebra and Trigonometry Review

Prior to registering for MAT 1234 or MAT 1221, you will need to take the online Calculus Placement Exam, which will be used to determine which mathematics course is most appropriate for you based on your skills in algebra and trigonometry. These exercises are intended as a review of many topics from algebra and trigonometry that might be on the exam. Note that this review does *not* cover every possible type of problem that may be on the exam. ***Do NOT use a calculator for these problems – calculators will not be permitted on the placement exam.***

1. Simplify the following as much as possible:

   a. $1/2 - 1/8$

   b. $1/2 + 1/4$

   c. $-2 - 3(-4)$

   d. $\left(2uv + u^2v^2 - u\right) + \left(3u^2v^2 - uv + v + 1\right)$

   e. $\left(3x^2y^2 - xy + 2x + 1\right) - \left(x^2y^2 - 2xy - x + 3\right)$

   f. $(2x + y)(3x - 4y)$

   g. $\left(x^3 - 2x^2 + 2x - 3\right)(2x - 3)$

   h. $\dfrac{1}{x} - \dfrac{1}{x+1}$

   i. $\dfrac{2x(x^2 + 1) - x^2(2x)}{x^2 + 1}$

   j. $\sqrt[3]{32}$

2. Factor the following completely:

   a. $x^2 - 5x - 24$

   b. $2x^2 - 32$

   c. $18x^2 - 3x - 6$

3. Divide $x^3 - 5x + 2$ by $x - 2$.

4. Solve the following: a. $2x + 1 = 3x - 4$ c. $2t + 7 - 3(1 - t) = 1 - 2t$

   b. $3(x - 2) < 4x - 3$ d. $|3x + 1| = 5$

5. Solve the following and graph the solution:

   a. $3 < 1 - 2x < 9$

   b. $|3x - 6| > 9$

6. Find the equation of the line through the point (2,-1) having slope –3.

7. Find the intersection of the lines $y = 2x - 1$ and $y = -x + 8$.

8. Let $f(x) = x^2 - x$. Find the following:

   a. $f(0)$ b. $f(3)$ c. $f(-2)$ d. $f(t)$ e. $f(x+2)$ f. $\dfrac{f(x+h) - f(x)}{h}$

9. Find   a. $\cos\dfrac{5\pi}{4}$ b. $\tan\dfrac{11\pi}{6}$ (*do not use a calculator*)

10. What is the radian measure of an angle whose degree measure is 120°?

11. Given that $\cos\theta = \frac{1}{2}$ and $\sin\theta < 0$, find $\cot\theta$.