

Algebra and Trigonometry Review

On the first day of class in MAT 1225 or MAT 1110 you will be given an Algebra/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. $(2uv + u^2v^2 - u) + (3u^2v^2 - uv + v + 1)$

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

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

g. $(x^3 - 2x^2 + 2x - 3)(2x - 3)$

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

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

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. $\frac{f(x+h) - f(x)}{h}$

9. Find a. $\cos \frac{5\pi}{4}$

b. $\tan \frac{11\pi}{6}$ (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 $\cot \theta$.