QUIZ 5 - MATH 111 Friday, February 21

YOUR NAME:_____ George Voutsadakis

Read each problem **very carefully** before starting to solve it and do only what is asked. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [4 points] A line ℓ_1 passes through the points $(-7, 21)$ and $(5, -27)$. Another line ℓ_2 is perpendicular to the line ℓ_1 and passes through $(-1, -8)$. Find an equation for the line ℓ_2 both in the point-slope and the slope-intercept form.

3. [4 points] The population of our Motor City was approximately 950,000 in 2000 and fell to approximately 670,000 by 2020.

   (a) Assuming a linear trend, write a model for $P(t)$, the population of the city as a function of time.

   (b) When is the population projected to reach half a million people according to your model?

3. [4 points] Bob stars his hike at a certain location and walks at a speed of 4.5 mph directly east. Alice starts her walk **at the same time** as Bob **at a location 4 miles east of Bob's starting location** and walks directly east at a speed of 3 mph.

   (a) Write a function $B(t)$ giving the distance covered by Bob in time t hours since the start of the walk.

   (b) Write a function $A(t)$ giving the distance covered by Alice in time t hours since the start of the walk.

   (c) Write and solve an equation to find the time it will take since the start of the walk for Alice and Bob to meet. (Write your answer in terms of hours and minutes.)