## MATH 1030-004, Exam 1 Sample

1. Of the 50 international students, 30 can speak Spanish, 20 can speak French, and 15 can speak Dutch. There are 15 students that can speak Spanish only, and there are 3 that can speak Spanish and Dutch only. 7 students can speak French and Spanish only, and 5 can speak French and Dutch only.
(a) How many students can speak all three languages?
(b) How many cannot speak any of the three languages?
2. If an item's value decreases by $37 \%$, by what factor has it changed? What if it increased by $350 \%$ ?
3. Suppose you invest $\$ 25,000$ now at an APR of $3 \%$. How much money will you have in 20 years if
(a) you earn simple interest?
(b) interest is compounded daily?
4. Find the annual percentage yield (APY) if a bank offers an APR of $7.10 \%$ compounded quarterly.
5. How long, in years, would it take you to count $\$ 10$ billion in $\$ 20$ bills, assuming you can count one bill each second?
6. The number of traffic accidents in some large city dropped from 80,500 in 2004 to 62,600 in 2014. Find the absolute and relative (percentage) change. (Express the relative change in \%.)
7. Suppose you want to save $\$ 22,000$ in 10 years. How much should you deposit daily to achieve this, if the bank offers $3.5 \%$ APR, compunded daily?
(b.) How much of the financial value comes from actual deposits, and how much from interest?
8. In track and field, Usain Bolt is the world record holder in a 200 meter race with the result of 19.19 seconds. What is his average speed in miles per hour? ( $1 \mathrm{~km}=1000 \mathrm{~m}, 1 \mathrm{mi}=1.61 \mathrm{~km}$.)
9. There are approximately 1 million suicides worldwide in a year. Express this quantity in suicides per minute.
10. A swimming pool is 125 feet long, 95 feet wide, and 9 feet deep.
(a) What is the volume of the pool in cubic feet?
(b) What is its volume in cubic meters? $(1 \mathrm{~m}=3.28 \mathrm{ft})$
