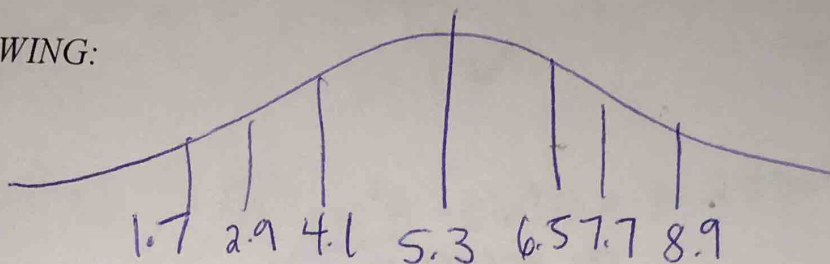Name **key**

or all questions, assume that the distribution is normal. For each problem, draw the normal curve and shade
e appropriate area. **Show all calculator steps!**

. A survey found that mean length of time that Americans keep their cars is 5.3 years with a standard deviation
f 1.2 years.

NORMAL CURVE DRAWING:

1.7 2.9 4.1 5.3 6.5 7.7 8.9

If a person decides to purchase a new car, find the probability that he or she has owned the old car for:

a) less than 2.5 years

$\text{normcdf}(0, 2.5, 5.3, 1.2) = .0098 \rightarrow .98\%$

b) between 2 and 5 years

$\text{normcdf}(2, 5, 5.3, 1.2) = .3983$

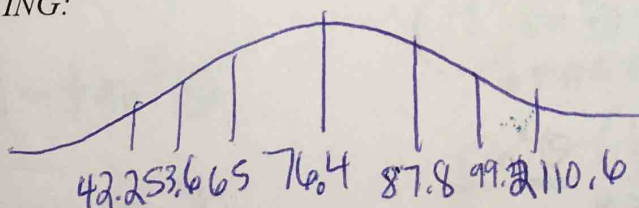c) more than 9 years

$\text{normcdf}(9, 1000, 5.3, 1.2) = .00102$

d) The length of time John keeps his car is in the 90th percentile. Determine how long John keeps his
car.

90% $\text{invnorm}(.9, 5.3, 1.2) = 6.84 \text{ yrs}$

2. The scores on an Algebra II test have a mean of 76.4 and a standard deviation of 11.4.

NORMAL CURVE DRAWING:

★a test can't go
above
100!

42.2 53.6 65 76.4 87.8 99.2 110.6

Find the probability that a student will score:

a) above 78

$\text{normcdf}(78, 100, 76.4, 11.4)$

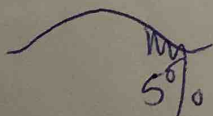.4250

b) below 60

$\text{normcdf}(0, 60, 76.4, 11.4)$

.0751

c) between 80 and 85

$\text{normcdf}(80, 85, 76.4, 11.4)$

.1508

d) Mr. Reeves scales his tests so that only 5% of students can receive an A. What is the minimum score
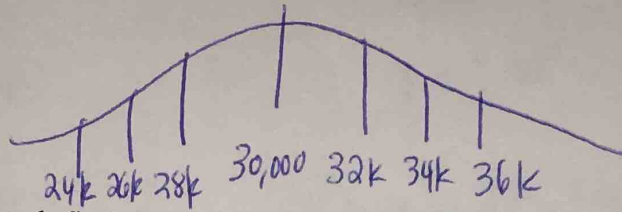Andrea can make on this test and still get an A?

5% $\text{invnorm}(.95, 76.4, 11.4)$

$= 95.15$

3. The average life of automobile tires is 30,000 miles with a standard deviation of 2000 miles.
NORMAL CURVE DRAWING:

24k 26k 28k 30,000 32k 34k 36k

If a tire is selected and tested, find the probability that it will have a lifetime:

a) between 25,000 and 28,000 miles

normcdf (25,000, 28000, 30000, 2000)

0.1524

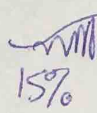b) between 27,000 and 32,000 miles

normcdf (27000, 32000, 30000, 2000)

.7745

c) over 35,000 miles

normcdf (35,000, 2,000,000, 30000, 2000)

.0062

d) The tire company will replace tires whose tread life falls in the lowest 15% of all tires of this model. What is the lifetime of a tire that qualifies for replacement?
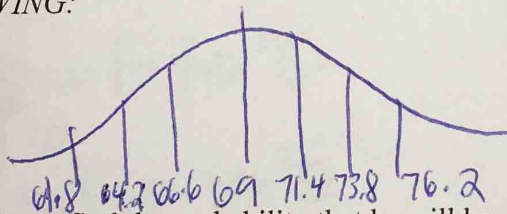
15%

invnorm(.15, 30000, 2000)

~ 27,927 miles

4. The mean height of an American man is 69" with a standard deviation of 2.4".

NORMAL CURVE DRAWING:

61.8 64.2 66.6 69 71.4 73.8 76.2

If a man is selected at random, find the probability that he will be

a) between 68" and 71" tall

normcdf(68, 71, 69, 2.4)

.4592

b) shorter than 67"

normcdf(0, 67, 69, 2.4)

.2023

c) taller than 72"

normcdf(72, 200, 69, 2.4)

.1056

d) If Jose is in the 75th percentile, how tall is he?

75%

invnorm (.75, 69, 2.4)

70.62 inches

e) if a man is in top 17.5%, how tall is he?

17.5%   1-.175

invnorm(.825, 69, 2.4)

= 71.24