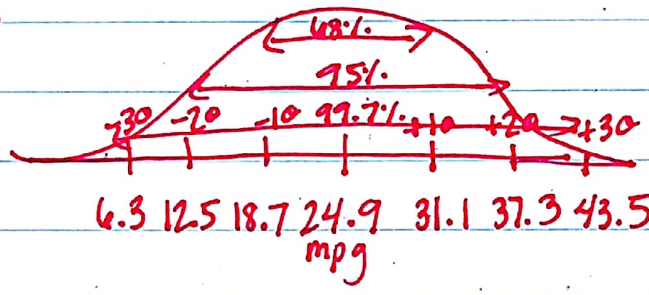
Problem Set 6 - KEY

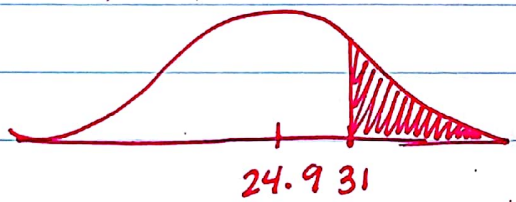
1. $\sim N(24.9 \text{ mpg}, 6.2 \text{ mpg})$

1.



2. Between 18.7 mpg and 31.1 mpg.

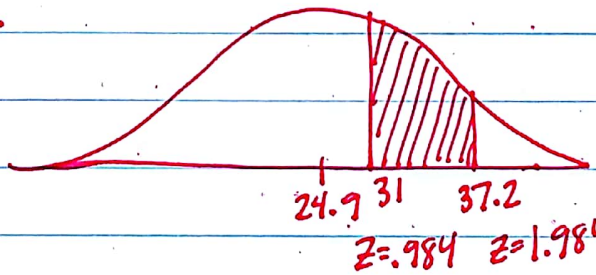
3.



$$z = \frac{31 - 24.9}{6.2} = .984$$

$P(X > 31) = P(z > .984) = .163$ or 16.3%.

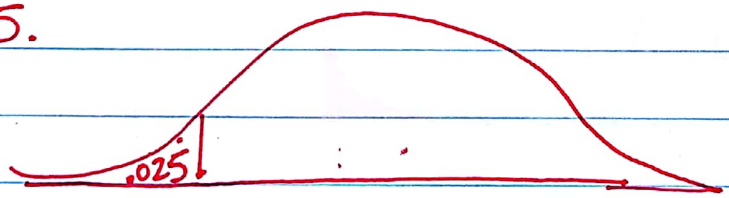
4.



$$z = \frac{37.2 - 24.9}{6.2} = 1.984$$

$P(31 < X < 37.2) = P(.984 < z < 1.984) = .139$ or 13.9%.

5.



$$-1.96 = \frac{X - 24.9}{6.2}$$

$X = 12.748$

The 2.5% of cars with the worst gas mileage get 12.748 miles per gallon or less.

2. $\sim N(1152, 84)$

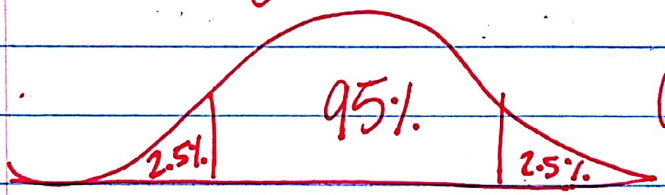
1. $z = \frac{1000 - 1152}{84} = -1.810$

A little less than 2 sds from the mean.

2. $z = \frac{1250 - 1152}{84} = 1.167$

A steer weighing 1000 pounds is more unusual than a steer weighing 1250 lbs., as 1000 is farther from the mean.

3. Unusual values are classified as those occuring outside of 2 sds from the mean.



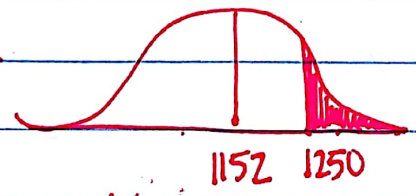
$(84) -1.96 = \frac{X - 1152}{84} (84)$

$-164.64 = X - 1152$

$X = 987.36$ lbs.

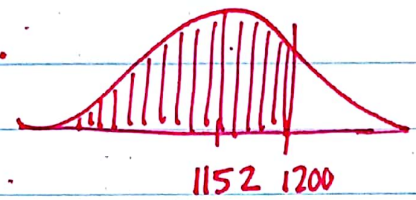
Any weight at or below 987.36 lbs. would be unusual.

4. 1.



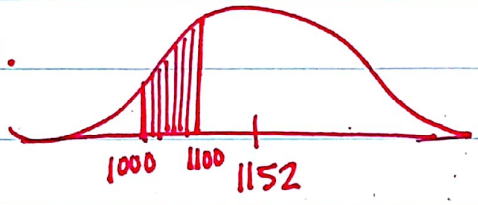
$z = \frac{1250 - 1152}{84} = 1.167$

$P(X > 1250) = P(z > 1.167) = .122$ or 12.2%

2. 

$z = \frac{1200 - 1152}{84} = .571$

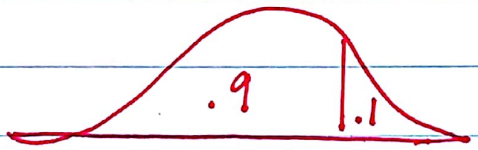
$P(X < 1200) = P(z < .571) = .716$ or 71.6%.

3. 

$z = \frac{1000 - 1152}{84}$ $z = \frac{1100 - 1152}{84}$

$z = -1.810$ $z = -.619$

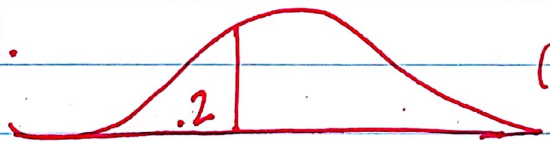
$P(1000 < X < 1100) = P(-1.810 < z < -.619) = .233$ or 23.3%.

5. 1. 

$z = 1.282$

$(84)\ 1.282 = \frac{X - 1152}{84}\ (84)$

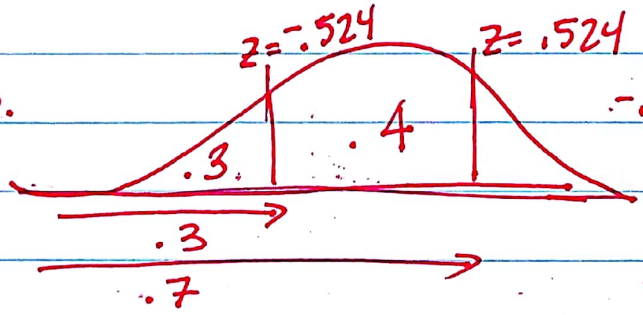
$X = 1259.688$ lbs.

2. 

$z = -.842$

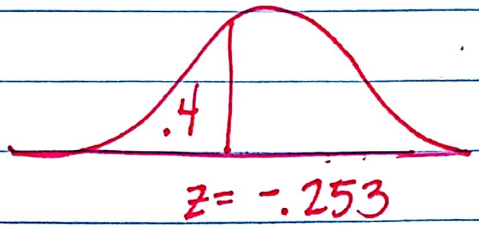
$(84)\ -.842 = \frac{X - 1152}{84}\ (84)$

$X = 1081.272$ lbs.

3. 

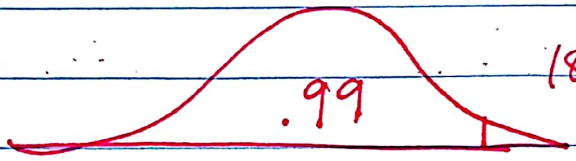
$-.524 = \frac{X - 1152}{84}$ $.524 = \frac{X - 1152}{84}$

$X = 1107.984$ lbs. $X = 1196.016$ lbs.

4. 

$(84)\ -.253 = \frac{X - 1152}{84}\ (84)$

$X = 1130.748$ lbs.

5. 

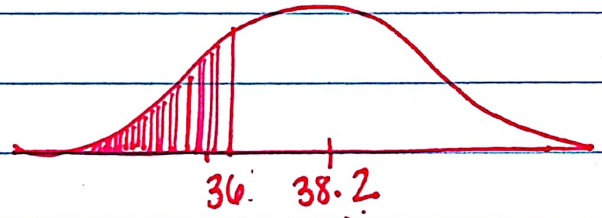
$(84)\ 2.326 = \frac{X - 1152}{84}\ (84)$

$X = 1347.384$ lbs.

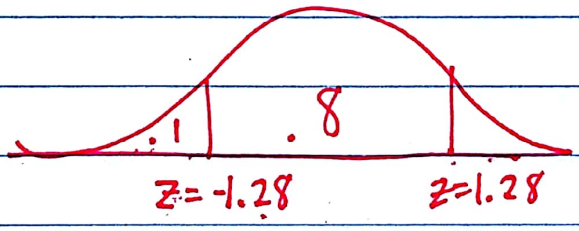
6. $\sim N(38.2 \text{ in}, 1.8 \text{ in})$

1. 3ft = 36 in

$z = \frac{36 - 38.2}{1.8} = -1.222$



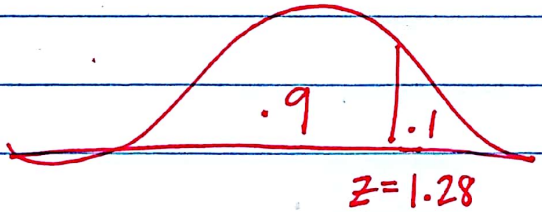
$P(X < 36) = P(z < -1.222) = .111$ or 11.1%.

2. 

$-1.28 = \frac{X - 38.2}{1.8}$ $1.28 = \frac{X - 38.2}{1.8}$

$X = 35.896$ in $X = 40.504$ in

The middle 80% of kindergarteners should be expected to be between 35.896 in and 40.504 in.

3. 

The biggest 10% of kindergarteners are at least 40.504 inches tall.