1)

a) $\mu = \frac{8+1+2+3+3+5+7+5}{8} = (4.25)$

b) 1, 2, 3, 3, 5, 5, 7, 8

median $= \frac{3+5}{2} = (4)$

c) $\sqrt{\frac{(1-4.25)^2+(2-4.25)^2+(3-4.25)^2+(3-4.25)^2+(5-4.25)^2+(5-4.25)^2+(7-4.25)^2+(8-4.25)^2}{8}}$

$\sqrt{\frac{10.5625+5.0625+1.5625+1.5625+0.5625+0.5625+7.5625+14.0625}{8}}$

$\sigma = \sqrt{\frac{41.5}{8}} = (2.28)$

d) 1, 2, 3, 3, 5, 5, 7, 8

$\frac{2+3}{2} = (2.5)$

e) 1, 2, 3, 3, 5, 5, 7, 8

$\frac{5+7}{2} = (6)$

f) $IQR = Q3 - Q1 = 6 - 2.5 = (3.5)$

g) $Max - Min = 8 - 1 = (7)$

h) $variance = \left(\sqrt{\frac{41.5}{8}}\right)^2 = (5.1875)$

2) $\frac{18(72)+30(64)}{18+30} = \frac{1296+1920}{48} = \frac{3216}{48} = 67$

3) (d)

4) (c)

5) (e)

6) a) $\mu = 600 + 0.5(640) = \$920$

$\sigma = 0.5(360) = \$180$

$IQR = 0.5(450) = \$225$

Maximum $= 600 + 0.5(1420) = \$1310$

b) $z = 1.80$

7. Option 1 (Find the z-score)

$z = \frac{31.95 - 71.75}{52.08} = -0.76$

No this price is not very low. It only falls 0.76 standard deviations below the mean. This is quite common considering 68% of the prices fall w/in 1 standard deviation of the mean.

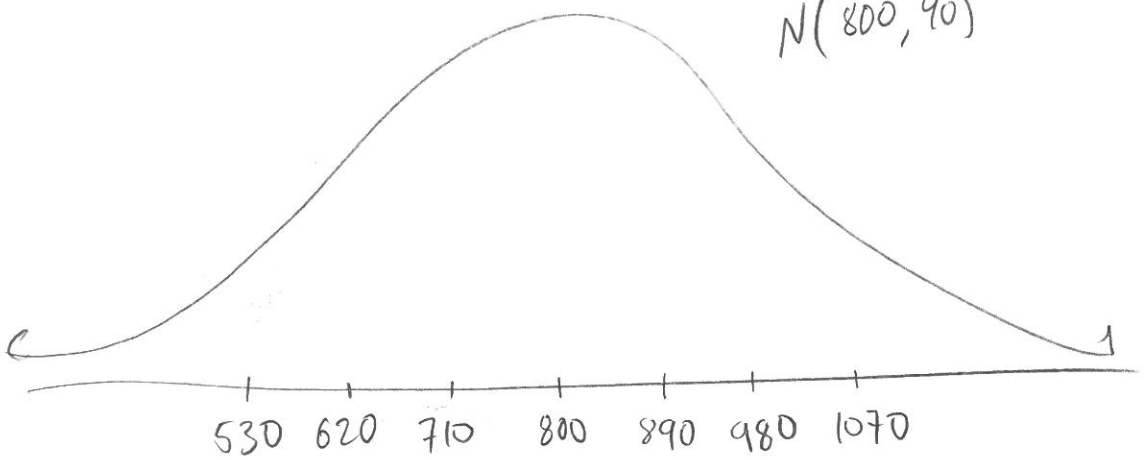
Option 2 (Find the probability that it occurs)

normalcdf = 0.22

No this is not a low price. According to the normal model there is a 22% of the price being \$31.95 or lower.

8.

$N(800, 90)$

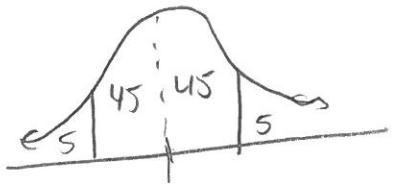


8b) invNorm

area: 0.25
μ : 800
σ : 90

739.30 climbs

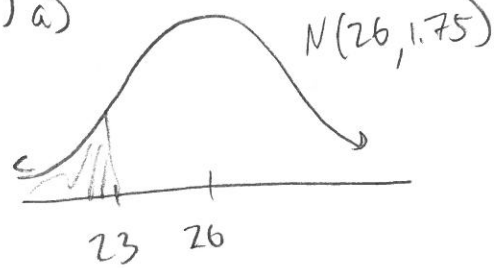
c)



invNorm
area: 0.05
μ : 800
σ : 90
651.96

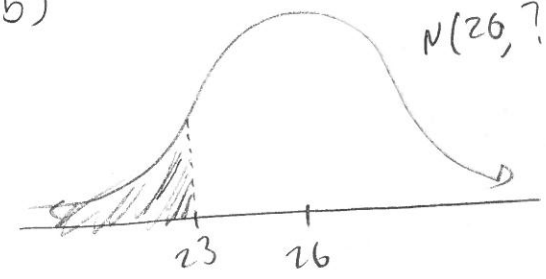
invNorm
area: 0.95
μ : 800
σ : 90
948.04

9) a)



normcdf
lower: -1000000
upper: 23
σ : 1.75
0.0432 ≈ 4.32%

b)



invNorm
area: 0.03
μ : 0
σ : 1
-1.88

$$z = \frac{x-\mu}{\sigma}$$

$$-1.88 = \frac{23-26}{\sigma}$$

$$\frac{-1.88}{1} = \frac{-3}{\sigma}$$

$$\frac{-3}{-1.88} = \sigma$$

$1.60 \approx \sigma$

c) Changing the standard deviation changes the accuracy of the machine. The smaller the standard deviation the more accurate the machine.

10) check with geogebra (answers will vary)

11) a) Quadratic / Parabolic, curved

b) no because the association is not linear

c) $\sqrt{x}$

12. a) direction – negative
form – linear
strength – strong
unusual feathes – no outliers

b) ≈ 0.85

d) The correlation coefficient would remain about the same. $z_x z_y$ would be close to the averages of x and y so $z_x z_y$ would be close to zero. Therefore it has very little effect on r.

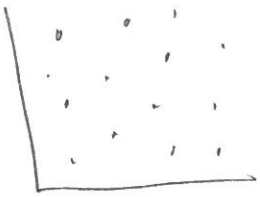
15 a) positive, exponential.

b) $r \approx 0.98$

13. a)

b)

c)



14. a) The graph shows a linear association between the two variables. There is a strong negative correlation between the two variables. There are no outliers.

b) ≈ 0.80

c) weaker. If you were to standardized the x and y coordinates of (4, 1215) you would get very large z-scores. z_x would negative and z_y would be positive. $z_x z_y$ would be a large negative number making $\frac{\Sigma z_x z_y}{n}$ more negative. If it were rounded it would make r more positive (weaker)

15c) log.

d) $r \approx 0.98$

$r^2 \approx 0.95$

f) According to our model 95% of the variability in strength is accounted for by the variability in the diameter of the rope.

e) According to our model 5% of the variability in strength is not accounted for by variability in diameter and is due to other factors.

16. $y - \bar{y} = r\left(\frac{s_y}{s_x}\right)(x - \bar{x})$

$y - 20.3 = 0.75\left(\frac{4.4}{2}\right)(x - 10.2)$

$y - 20.3 = 1.65x - 7.65$

$+20.3 \qquad +20.3$

$\hat{y} = 1.65x + 12.65$