1.

a)

Considering that the return fee is given by x.

The store manager wants to know how much he/she should increase x. Therefore:

$$Sales\ comission - hidden\ action = 0 \Leftrightarrow 20y \times 0.5 = xy \Leftrightarrow x = 20 \times 0.5 \Leftrightarrow x = 10$$

Thus, in order to pay off we know that:

$$New\ return\ fee - Old\ return\ fee = 10 - 0.5 = 9.5 \Longrightarrow \uparrow x = 9.5$$

Regarding the number of units he/she will sell to his/her is none, and this is due to the salesperson not have any additional money.

b)

We are given the information that the salesperson effort is given by e.

We are also know that with the new returns policy is $y = e$, whilst before was $y = 0.8e$

Since now the equation is as simple as $y = e$, it is easy to understand that with these new returns policy the output is equal to the effort, or in another words, the output depends on all the effort given by the salesperson and only that.

Before it wasn´t as clear, but an easy explanation is that the salesperson would sell without performing much effort or none at all, on which he/she would get compensated on the sales commissions nevertheless.

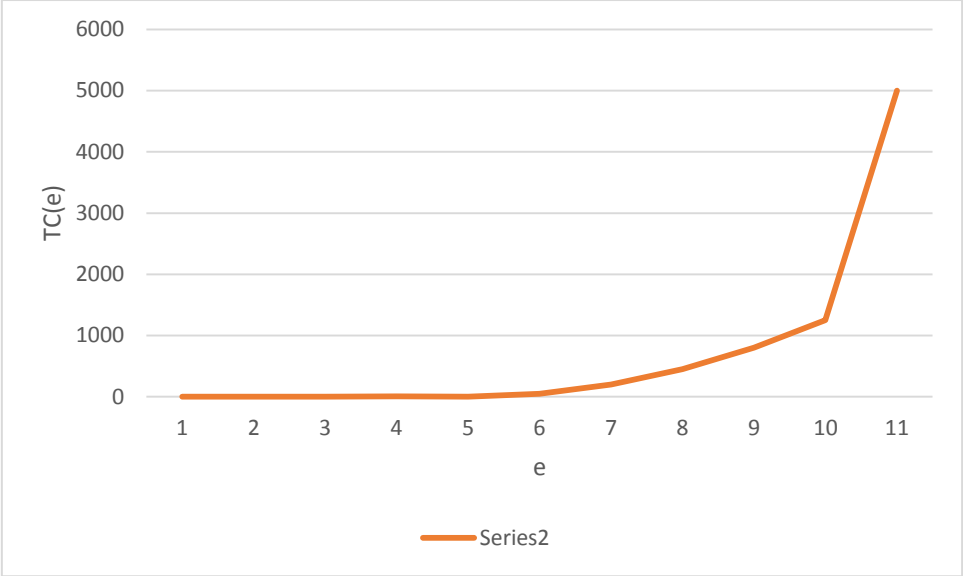
c)

We are given that the marginal cost of effort is: $MC(e) = e$, and because it is emphasized that the derivative of $de^2 = 2e$:

A simple algebraic expression of the total cost may be: $TC(e) = \frac{e^2}{2}$
We can easily conclude that because, if you think on contrary, as in deriving the $TC(e)$:

$$\frac{\partial TC(e)}{\partial e} = \frac{\partial\left(\frac{e^2}{2}\right)}{\partial e} = e = MC(e)$$

The total cost of effort function:




Thus, knowing that the total cost of effort is $TC(e) = \frac{e^2}{2}$, we can understand that the slope will be positive, and it will also increase at an increasingly higher rate. This intuitively is comprehensible knowing that as the salesperson performs better (more effort) the bonus costs will increase as well.

d)

We are given the information that the salesperson was selling 20 units to her or his friends before the new returns policy was put in place. Thus:

Before the new returns policy: $MC(e) = MR(e) \Leftrightarrow e = 0.5 \times 20 \times 0.8 \Leftrightarrow e = 8$

With the new returns policy: $MC(e) = e \Leftrightarrow e = 0.5 \times 20 \Leftrightarrow e = 10$

There will be two increases in profit, the first one from the increase of 2 (10-8) units sold, and the second one from the increase in return fee.

$(1): 2 \times 0.5 \times 20 = 20€$ ; $(2): 20 \times 9.5 = 190€$ $\Rightarrow$ $Total\ increase\ in\ profit = 20 + 190 = 210€$

2.

We know that the demand is $P = 50 - 2Q$, the company has the capacity of 5 units and the total cost function is $TC = 10Q + 100$.

a) $Revenue = PQ = (50 - 2Q)Q = 50Q - 2Q^2$

$Max_Q \pi = PQ - TC = 50Q - 2Q^2 - 10Q - 100$

FOC:

$\frac{\partial \pi}{\partial Q} = 0 \Leftrightarrow 50 - 4Q - 10 = 0 \Leftrightarrow Q = 10$ But we are given that the maximum quantity is 5 units, thus

$Q = 5 \Rightarrow P = 50 - 2 \times 5 \Leftrightarrow P = 40$

$\pi = PQ - TC = 5 \times 40 - 10 \times 5 - 100 \Leftrightarrow \pi = 50$

b) We are given that the capacity is now 15 units and the total cost function is $TC = 8Q + 125$.

$Max_Q \pi = PQ - TC = 50Q - 2Q^2 - 8Q - 125$

FOC:

$\frac{\partial \pi}{\partial Q} = 0 \Leftrightarrow 50 - 4Q - 8 = 0 \Leftrightarrow Q = 10.5 \Rightarrow P = 50 - 2 \times 10.5 \Leftrightarrow P = 29$

$\pi = PQ - TC = 10.5 \times 29 - 8 \times 10.5 - 125 \Leftrightarrow \pi = 95.5$

$I = \pi b - \pi a = 95.5 - 50 = 45.5$

c) We know that $I = 20$

$I = \pi c - \pi a \Leftrightarrow 50Q - 2Q^2 - 8Q - 125 - 50 = 20 \Leftrightarrow 2Q^2 - 42Q + 95 = 0$

$Q = \frac{42 \pm \sqrt{42^2 - 4 \times 2 \times 95}}{4} \Leftrightarrow \frac{42 \pm \sqrt{1764 - 760}}{4} \Leftrightarrow \frac{42 \pm \sqrt{1004}}{4} \Leftrightarrow Q = 18{,}42\ V\ Q = 7{,}92$

Therefore, $Q = 7{,}92$ because 18,42>15.

$P = 50 - 2 \times 7.92 \Leftrightarrow P =$

3. “The market power of a monopolist and its ability to set prices above marginal costs is limited by the own-price elasticity of demand”

A monopoly is when there is only one firm producing a certain good, and thus this firm has a high market power due to not having any competition. This makes the firm a price maker instead of a price taker, where it has the market power of setting prices or quantities (not both). If this monopoly were to raise its price without losing all of its sales, it has to maximize its profit by producing where MR=MC. Even though it has a high power, the monopoly still faces a few limitations due to its demand having a negatively sloped curve (not perfectly inelastic curve). Thus, the more elastic the demand curve, the less a monopoly can raise its price without losing sales (less pricing power). So, the firm’s profit-maximizing condition that marginal revenue equals marginal cost:

$MC = p\left(1 + \frac{1}{\varepsilon}\right) = MR$, and by rearranging $\frac{p}{MC} = \frac{1}{1+\frac{1}{\varepsilon}}$

And this says that the ratio of the price to marginal cost depends only on the elasticity of demand at the profit-maximizing quantity.