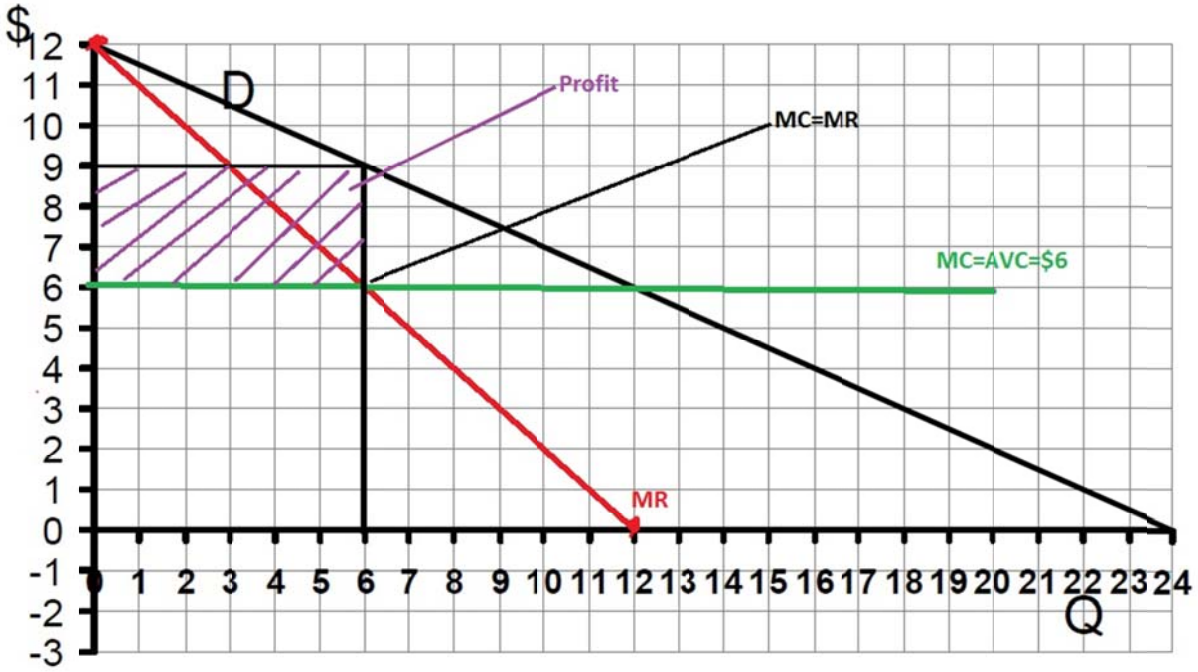
Hi class, I decided to do one last guide for you guys based on the multiple choice questions for the last few weeks of class. Once again, I'm going to add a disclaimer that this guide is by no means error-free (once again, did not proof-read) and you should follow what Professor Holmes' does or says over this guide (or in the case of people from other sections, follow your TA!)

Kelvin, like the temperature

Below, I've drawn in the necessary lines to help answer the next few questions. Remember, for a monopolist with a linear demand, we can use the rule that the MR is twice as steep and has the same Y-intercept. Saying that it's twice as steep means it will hit the x intercept twice as fast – meaning instead of having 24 as the x intercept, 12 is the x intercept for the MR line.



1) We can just read this off, Q=12 is when MR=0. So, the answer is D.
2) This is a general rule that you should also keep in mind. If you remember your monopoly worksheet, the place where revenue is maximized is also where MR=0. So, the answer is A.
3) Since the monopoly will produce where MC=MR (quantity), we see that they will produce 6 units. However, they will charge all the way up to where the demand curve is (since that's the highest they can charge). We see that this corresponds to a price of $9, so the answer is C.
4) We just need to calculate the purple box above. The box corresponds to the area that is left over after subtracting operating cost (which is just variable cost, or equivalently, total cost without fixed cost) from revenue. Operating cost here is the rectangle under the green line between Q=0 and Q=6, so that corresponds to an area of $36, and revenue here is $54 since the monopolist

sells 6 units at $9 each. $54-$36=$18. Obviously, the easier way you can find the profit here is just to find the area of the purple box, which also gives us $18. The answer is E.

5) The firm is indifferent between producing and shutting down when its profit is 0. Here, we have that the profit is $18, so if there was a fixed cost of $18, then the firm will make $0 and will be indifferent to either shutting down or producing. The answer is E.
6) If it can perfectly price discriminate, this means that it can charge a different price to different consumers perfectly. This just means that the monopoly can now price according to the demand curve (look at it as the monopolist can sell the second unit for $11, the fourth unit for $10, etc). They no longer need to charge the same price for every unit. Here, their profit is the triangle above the cost and beneath the demand curve. The base has a length of 12 and the height is 6, so the area of the triangle is $36. The answer is D.
7) This is from the reading on intellectual property by Professor Holmes, and also discussed in the intellectual property worksheet. Review those if you are confused on this one. The answer is D.
8) Whatever Jim does, Pam can do two things – "Left" or "Right". So the question asks that if Pam believes Jim will play "Up", then what will Pam do to maximize her payoff? Well, if she plays "Left", then she gets a payoff of 2. If she plays "Right", then she gets a payoff of 3. So it's better for her to play "Right" if Jim is playing "Up". The answer is B.
9) A dominant strategy is a strategy that you will always want to do, regardless of what the other person does. Jim has one, and we see that playing "Down" is dominant because if Pam plays "Left", then Jim playing "Up" will give him 2 and playing "Down" will give him 3 – so this means that he will play "Down" if Pam plays "Left". If Pam plays "Right", then Jim playing "Up" will give him 0 and playing "Down" will give him 1. So He will want to play "Down" if Pam plays "Right". Here, we see that Jim will always play "Down" regardless of whether Pam plays "Left" or "Right". The answer is B.
10) The Nash equilibrium here can be found by looking at each box (by box, I mean looking at the four different things that could happen – such as Pam plays "Left" and Jim plays "Up", or Pam plays "Right" and Jim plays "Up", and so on) and seeing whether someone can be better off doing something else. So let's start with box 1 (Jim-"Up", Pam-"Left"). Here, we see that Pam gets a payoff of 2 and Jim gets a payoff of 2 as well. However, we see that Jim could have done better if he had picked "Down" and Pam could also have done better if she had picked "Right". So, Jim playing "Up" and Pam playing "Right" is not a Nash equilibrium. Let's move on to box two now – where Jim plays "Up" and Pam plays "Right". Ask yourself the same question, can someone do better? Well yes, since Jim could play "Down" and get 1 as a payoff. Here, Pam can't do better given that Jim is playing "Up", but since Jim could do better given that Pam is playing "Right", we see that this is not a Nash equilibrium either. We do the same with box 3, where Jim plays "Down" and Pam plays "Up". Now let's look at Jim, freezing what Pam would do. By freezing, I mean let's just assume she's going to play left (since in box 3, she plays left and Jim plays down). So if Pam is playing "Left", can Jim do better by doing something else? Well, we see that Jim can't do better by doing something else since he's getting 3 right now from playing "Down" but if he switched to "Up", he would only get 2. Now, let's freeze Jim – so now he's assumed to be playing "Down". Can Pam do better off by switching? Right now she's playing "Left", which pays 1. If she switched to "Right" (remember that we are assuming Jim will play

"Down"!), she will get 0 as a payoff. So we see that she can't do better switching either. Since both players can't do better by switching, box 3 (Pam-"Left", Jim-"Down") is a Nash equilibrium. Let's check box 4 now. Using the same freezing technique, we see that Pam can actually do better off if she switched her strategy after assuming that Jim is going to play "Down". So box 4 is not a Nash equilibrium. We are left with box 3 as a Nash equilibrium and so the answer is B.

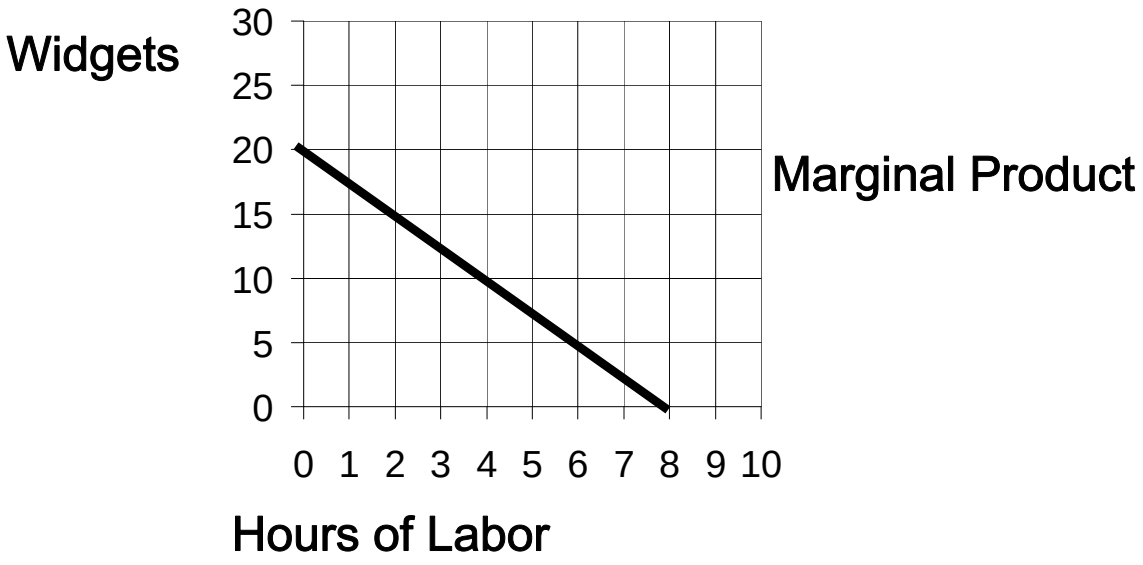
11) An oligopoly will want to try to collude with the other firms and so they know what each other are doing and thus make a higher profit. But as you may remember, the firms will have incentives to cheat, so b) is not correct (since collusion will not prevail if a firm cheats). c) is false by definition since there's no reason to collude if profits are lower after collusion. d) is also not true, since the pursuit of self interest often means everyone is not as well off as they could be. For example, if firm A, B, and C all decide to charge $50 on a product, and let's say firm A wants to raise the price it's charging to $60 – then firm A is worse off because now people will just buy from firm B and firm C, since it's cheaper to do so. So even though all three firms can agree and charge $60 and make the collective profits higher, they don't because they don't know what the other firms will do. So, d) is not true as can be seen in our example. That means a) is true, as also can be seen from the example. If all three firms decide to cooperate together, they can behave like a monopolist and "own" the whole market (assuming there are only firms A, B, and C in the industry). They can now charge all the way up to where people are willing to pay (the demand curve), just as a monopolist can. The answer is A.
12) This is very similar to the Intellectual Property worksheet, so I would review that if you are confused on this one. But we see that if the fixed cost is low ($250), then the monopoly will still develop the drug since the two year operating profit is higher than the fixed cost and in the end the monopolist makes a profit from developing the drug. So, a one year patent is good enough in the case of a low fixed cost if the goal is to maximize total surplus. However, with a higher fixed cost, the monopoly will not produce if it is only given a one year patent, and as we saw in the worksheet the total surplus is 0. So if we gave them a two year patent, we see that they will produce and total surplus is higher. So the answer is D.

Here's an extra note from fellow TA Rishabh Kirpalani that may help in understanding this question.

"Note that the question only asks you to compare total surplus and not consumer or producer surplus. When the fixed cost is 250, under a patent that lasts 0 years the firm will not develop the drug and total surplus is 0. The choice is now between patent 1 (lasts 1 year) and patent 2 (lasts 2 years). Under patent 1 the firms operating costs over the two years is greater than the fixed cost and so the firm will choose to develop the drug. Under both patents, the TS in the first year will be equal since the firm sets a monopoly price and the dead-weight loss is the same. However in the second year, the TS from patent 1 will be greater than patent 2 since the firm sets a monopoly price under patent 2 in year 2 as a result of which there will be some dead-weight loss. Under patent 1, the firm goes back to competitive pricing and hence there is no DW loss. Thus total surplus will be higher under patent 1 with a fixed cost of 250. When the fixed cost is 750, the only possible patent under which the firm will choose to develop the drug is patent 2."

13) This example illustrates that A is true (refer to intellectual property worksheet answer key).

14) This is from the reading on intellectual property, but India has an incentive to do both A and B and that's why they have a weak IP protection policy.
15) Knowing the definitions of each word helps a lot in this. But C is the correct answer since after being labeled TBTF, the bank can be more risky since they have more insurance given to them by the regulators.
16) If you draw the graphs for both a competitive market and a monopoly that can perfectly discriminate, you will see that the total surplus areas are the same – although in the case of a perfectly competitive firm all the surplus goes to the consumer and in the case of a monopoly that can perfectly discriminate, all the surplus is the monopolist's profit. The answer is A.
17) a) is true, and I think is best explained in Professor Holmes' Lecture 14(i) slides. b) is also true (refer to slides as well), but the intuition is that a firm will not hire workers that are not doing as much as they are being paid. (i.e. If you were the boss, you would not pay someone $100 to do $50 of work, but you will pay someone $100 to do $200 of work or someone $100 to do $100 of work). C is also true, since this wage and marginal product thing is just another case of MC=MR for the firm. So, the answer is D.
18) This is just by the definition of a moral hazard. You are insured and you change your behavior because you are now more protected than you were before. The answer is B.



Question 19.
Remember that to figure out labor demand, the key equation is that the firm sets labor L so that the value of the marginal product (i.e. price times marginal product) equals the wage. You can write this as:

$$P*MP = W.$$

In the problem you are given that W = $15 and P = $3. Hence your job is to find that Labor quantity such that

$$\$3*MP = \$15,$$

or equivalently, where MP = 5. In the figure you can see that the MP (marginal product) equals 5 (on the vertical axis) when the hours of labor equals 6. So the correct answer is (d).

Question 20.
This question starts by saying that the wage is now $60, while the price is the same at $3. So the first step is to figure out labor demand. Following the same approach as above, we need to find the labor where

$$\$3*MP = \$60,$$

or MP = 20. But we can see in the figure that MP = 20 exactly at L = 0. So the firm doesn't hire any labor. Thus spending on labor equals zero, which is less than before. So (b) is the correct answer.