Problem 1. Last year real GDP in the imaginary nation of Oceania was 561.0 billion and the population was 2.2 million. The year before, real GDP was 500.0 billion and the population was 2.0 million. What was the growth rate of real GDP per person during the year?

(a) 12 percent

(b) 10 percent

(c) 4 percent

(d) 2 percent

Problem 2. Real Foods produced 400,000 cans of diced tomatoes in 2009 and 460,000 cans of diced tomatoes in 2010. It employed the same number of labor hours each year. Real Foods productivity

(a) decreased 13 percent.

(b) was unchanged.

(c) increased 13 percent.

(d) increased 15 percent

Answers

Problem 1: (d). Last year, Oceania had per capita GDP of

$$\frac{\$561,000,000,000}{2,200,000 \text{ people}} = \$255,000 \text{ per person.}$$

The year before that, Oceania had per capita GDP of

$$\frac{\$500,000,000,000}{2,000,000 \text{ people}} = \$250,000 \text{ per person.}$$

So real GDP per person changed by

$$\frac{255,000 - 250,000}{250,000} \times 100 = 2\%.$$

Problem 2: (d). Employed same labor each year. Doesn't tell us how much labor, so let's be lazy and assume it was only one person (we could use any number, as long as it was the same each year). Then productivity changed by

$$\frac{460,000 - 400,000}{400,000} \times 100 = 15\%.$$

Problem 3. If your firm's production function has constant returns to scale, then if you double all your inputs, your firm's output will

(a) double and productivity will rise.

(b) double but productivity will not change.

(c) more than double and productivity will rise.

(d) more then double but productivity will not change.

Problem 4. Country A and country B are the same except country A currently has a lower level of capital. Assuming diminishing returns, if both countries increase their capital by 100 units and other factors that determine output are unchanged, then

(a) output in country A increases by more than in country B.

(b) output in country A increases by the same amount as in country B.

(c) output in country A increases by less than in country B.

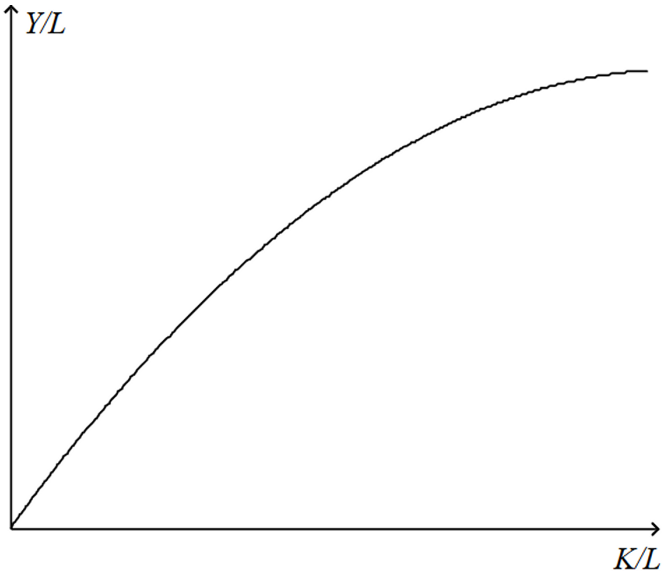
(d) None of the above is necessarily correct

Answers

Problem 3: (b). Constant returns to scale means that when you double the input of both capital and labor, output will also double. This means that productivity does not change since each worker is producing the same number of stuff.

Problem 4: (a). This is just by definition of diminishing returns. It also explains why undeveloped countries can develop very quickly—this is called the ~~ketchup~~ **catch-up effect**. New capital goes a long way in an economy that doesn't have much capital to begin with.

On the horizontal axis, K/L represents capital K per worker L. On the vertical axis, Y/L represents output Y per worker L.



Problem 5. The curve becomes flatter as the amount of capital per worker increases because of

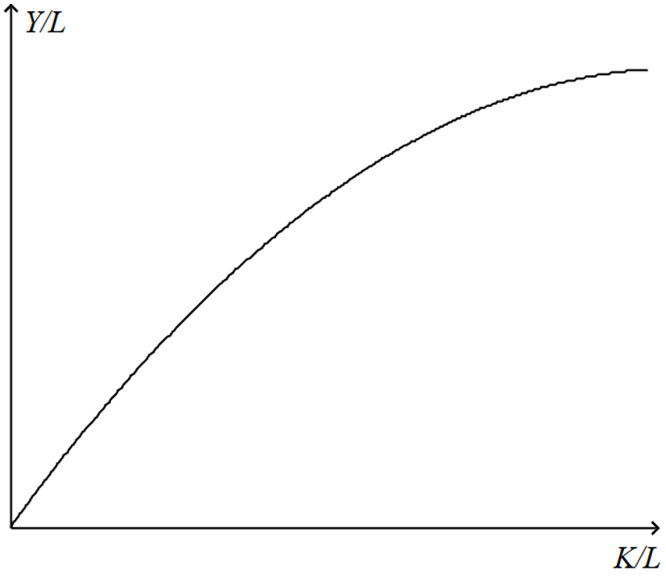
(a) increasing returns to capital.

(b) increasing returns to labor.

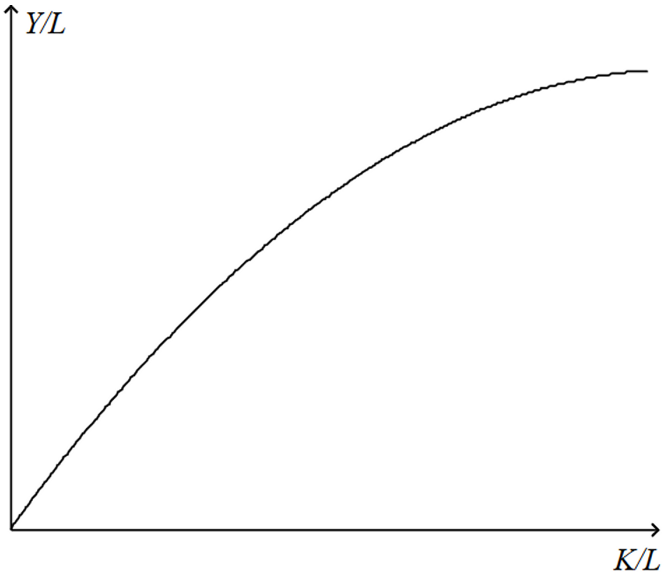
(c) diminishing returns to capital.

(d) diminishing returns to labor.

Answers



Problem 5: (c). Look at it this way. Hold L constant and increase K. Then K/L will increase and we'll move up and to the right on the curve. Since the slope of the curve is becoming flatter, each addition to K causes less and less increase in Y/L. So returns of capital are diminishing.



Problem 6. The shape of the curve is consistent with which of the following statements about the economy to which the curve applies?

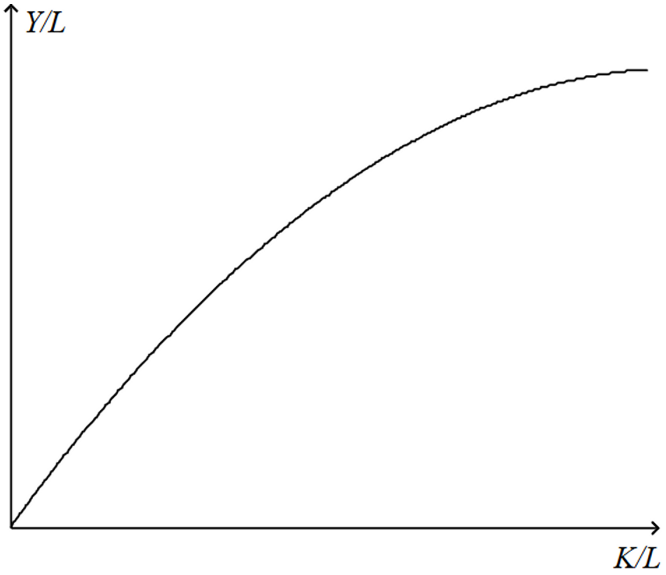
(a) In the long run, a higher saving rate leads to a higher level of productivity.

(b) In the long run, a higher saving rate leads to a higher level of income.

(c) In the long run, a higher saving rate leads to neither a higher growth rate of productivity nor a higher growth rate of income.

(d) All of the above are correct.

Answers



Problem 6: (d).

(a) More savings means more investment, and more investment more higher productivity in the long run.

(b) Higher productivity in the long run leads to higher income.

(c) As the higher saving rate allows more capital to be accumulated, the benefits from additional capital become smaller over time, and so growth slows down.

Problem 7. ABC Co. sells newly issued bonds. JLG Co. sells newly issued stocks. Which company is raising funds in financial markets?

(a) only ABC

(b) only JLG

(c) both ABC and JLG

(d) neither ABC nor JLG

Problem 8. In a closed economy, if Y remained the same, but G rose, T rose by the same amount as G, and C fell but by less than the increase in T, what would happen to private and national saving

(a) national saving would fall and private saving would rise

(b) national saving would rise and private saving would fall

(c) both national saving and private saving would fall

(d) None of the above.

Answers

Problem 1: (c). When ABC sells bonds, it receives money from whoever buys the bonds. When JLG sells stocks, it receives money from whoever buys the stocks. So both ABC and JLG have more funds.

Problem 2: (c). Both national saving and private saving would fall. Make up numbers if you have to. For example, suppose $Y = 10, G = 3, C = 4$, and $T = 2$. Then originally we have

$$\text{Private saving} = Y - T - C = 10 - 2 - 3 = 5,$$
$$\text{National saving} = Y - C - G = 10 - 4 - 3 = 3.$$

Now suppose $\Delta G = \Delta T = 2$, whereas $\Delta C = -1$. So $G = 5, T = 4, C = 3$. Then

$$\text{Private saving} = Y - T - C = 10 - 4 - 3 = 3,$$
$$\text{National saving} = Y - C - G = 10 - 3 - 5 = 2.$$

Someone asked whether the numbers I used were special in some way. The answer is no—I just made sure they satisfied the criteria given in the problem. But it's a really good concern and it's worth trying to think about it more generally. In what follows, I will use large arrows to signify a large change, a small arrow to signify a small change, and a bar to signify no change. For private saving, we have

$$S^{Private} = \bar{Y} - \Big\uparrow T - \downarrow C$$

So we're *subtracting* a smaller C, which by itself makes $S^{Private}$ go up a little. But we're *subtracting* a much larger T, which by itself makes $S^{Private}$ go down a lot. Therefore $S^{Private}$ goes down overall. The same logic works for national saving:

$$S^{Public} = \bar{Y} - \downarrow C - \Big\uparrow G \implies \downarrow S^{Public}.$$

Loanable Funds Market

- People who want to borrow money *demand* loanable funds. If the interest rate is low, then they'll be willing to borrow more. So the demand for loanable funds is downward sloping. *Investment is the source of the demand for loanable funds.*

- People who want to lend money *supply* loanable funds. If the interest rate is high, then they'll be willing to lend more. So the supply for loanable funds is upward sloping. *Saving is the source of the supply of loanable funds.*

- Where the supply and demand intersect gives the equilibrium interest rate and quantity of loanable funds. Thus, in equilibrium, saving equals investment.

Problem 9. Which of the following could explain a decrease in the equilibrium interest rate and in the equilibrium quantity of loanable funds?

(a) The demand for loanable funds shifted rightward.

(b) The demand for loanable funds shifted leftward.

(c) The supply of loanable funds shifted rightward.

(d) The supply of loanable funds shifted leftward.

Problem 10. Suppose the government changed the tax laws, with the result that people were encouraged to consume more and save less. Using the loanable funds model, a consequence would be

(a) lower interest rates and lower investment.

(b) lower interest rates and greater investment.

(c) higher interest rates and lower investment.

(d) higher interest rates and higher investment.

Answers

Problem 9: (b). Just draw the typical supply and demand curves, with r on the y-axis instead of p. Then shift the demand curve to the left and viola.

Problem 10: (c). If people save less, then the supply of loanable funds will decrease, i.e. shift to the left. This will increase the interest rate and decrease the amount of loanable funds in equilibrium.