Problem 1. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

What is the expenditure multiplier?

Answer 1. As per the usual definition, we have

$$\text{expenditure multiplier} \equiv \frac{1}{1 - MPC} = \frac{1}{1 - 0.8} = 5.$$

Problem 2. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

Find the budget deficit.

Answer 2. As per the usual definition, we have

$$\text{budget deficit} \equiv G + TR - TX = 15 + 10 - 20 = 5.$$

So the government is using 5 more than it's collecting in taxes.

Problem 3. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

Find real disposable income.

Answer 3. As per the usual definition, we have $Y_d \equiv Y - TX + TR$. But we need to know Y to solve for it, which is the sum of expenditures:

$$Y = C + I + G + EX - IM = 60 + 20 + 15 + 5 = 100 \implies Y_d = 100 - 20 + 10 = 90.$$

Problem 4. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

Find equilibrium real GDP.

Answer 4. In equilibrium, supply equals demand. Demand is the sum of expenditure. We found out in the previous problem that expenditure is 100. Therefore equilibrium real GDP is 100.

Problem 5. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

If the government increases its purchases by 5 units through deficit financing, the new equilibrium real GDP will equal how many units? (For this question assume no crowding out.)

Answer 5. We concluded earlier than the expenditure multiplier is 5. If G goes up by 5, we conclude that AD increases by $5 \times 5 = 25$. Therefore real GDP is now 125.

Problem 6. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

The government increases its purchases by 5 units through deficit financing. Calculate the new C, Y_d, and budget deficit. For this question assume no crowding out.

Answer 6. We know from the previous question that AD increases by 25. We know that G will go up by 5. Hence the remaining 20 comes from increases in C. So now $C = 60 + 20 = 80$.

Disposable income is $125 - 20 + 10 = 115$ since taxes and transfer payments have not changed. The new budget deficit is $G + TR - TX = 20 + 10 - 20 = 10$.

Problem 7. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

The government increases its purchases by 5 units and raises taxes by the same amount to pay for it. What's the new real GDP?

Answer 7. This is a balanced budget increase in government purchases. Recall that a balanced budget increase in G will have *no multiplier effect* because the multiplier effects are "canceled out" by the increase in taxes. Hence AD shifts by only 5 and we have $Y = 105$.

Problem 8. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

The government increases its purchases G by 5 units and raises taxes by the same amount to pay for it. Find the new C, Y_d and budget deficit.

Answer 8. We know that $Y = 105$ from above. All 5 of that comes from an increase in G, the increase in taxes implying no increase in consumption. Hence $C = 60$ still.

Taxes have gone up by 5, so disposable income is now $Y_d = 105 - 25 + 10 = 90$. Finally, the budget deficit is $G + TR - TX = 20 + 10 - 25 = 5$.

Problem 9. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

The government increases transfer payments by 5 units and raises taxes by the same amount to pay for them. Calculate the new equilibrium real GDP.

Answer 9. Changes in taxes and transfer payments arise by how they change disposable income and thus consumption. But uh, if the government takes 5 away in taxes and then turns around and gives you 5 back in transfers payments right away, your disposable income is totally unchanged, and thus consumption is totally unchanged. So nothing interesting happens at all: $\Delta Y_d = \Delta Y - \Delta TX + \Delta TR = 0 - 5 + 5 = 0$. Hooray. $Y = 100$.

Problem 10. Here's some data about a country:

C	60
I	20
G	15
$EX - IM$	5
TX	20
TR	10
MPC	0.8

The government increases transfer payments by 5 units and raises taxes by the same amount to pay for them.

Answer 10. Right, so like I said, nothing changes with C or Y_d, i.e. they're still 60 and 90, respectively (from problem 3). Nothing happens with the budget deficit either: the government uses 5 more on transfer payments and collects 5 more in tax revenue:

$$\Delta\text{budget deficit} = \Delta G + \Delta TR - \Delta TX = 0 + 5 - 5 = 0 \implies \text{budget deficit} = 5.$$