An auto factory sends cars from plant 1 and 2 to dealership A and B. Plant 1 has 28 cars to send, Plant 2 has 8 to send. Dealer A needs 20 cars, Dealer B needs 16. Transportation costs are $220 from 1 to A, $300 from 1 to B, $400 from 2 to A, and $180 from 2 to B. Transportation costs are limited to $10640. How many cars should be sent from each plant to each of the dealerships?

Solution:

Let x- cars should be sent from I plant to A dealership

y- cars should be sent from I plant to B dealership

z- cars should be sent from II plant to A dealership

u- cars should be sent from II plant to B dealership, then

$x+y=28$

$z+u=8$

$x+z=20$

$y+u=16$

$220x+300y+400z+180u=10640$

From the third $z=20-x$

From the fourth $u=16-y$

Replace the z and u in the fifth equation

$220x+300y+400(20-x)+180(16-y)=10640$

$-180x+120y=-240$

From the first $y=28-x$

$-180x+120(28-x)=-240$

$-300x=-3600$, so $x=12$, $y=28-12=16$, $z=20-12=8$ and $u=16-16=0$

Answer:

12 cars should be sent from I plant to A dealership

16 cars should be sent from I plant to B dealership

8 cars should be sent from II plant to A dealership