



Math Olympiad and Problem Solving Programs
F120 - Intermediate Problem Solving
Problem Set 14.1 - Sum and Multiples

Name:

Date:

1. $\boxed{\text{Linda}=8, \text{Minda}=32}$
2. $\boxed{303}$
3. $\boxed{18}$
4. If Justin had planted 10 more trees, then he would have planted three times as many trees as Ethan, and their total would have been $190 + 10 = 200$. So now we will divide $200 \div (3 + 1) = 200 \div 4 = 50$. So if Justin planted three times as many trees as Ethan, than Ethan planted 50 trees, and Justin planted $50 \times 3 = 150$ trees. But he planted 10 trees LESS than three times what Ethan planted, so we have to subtract 10. So Justin planted $150 - 10 = \boxed{140}$
5. If Angela travels twice as fast as Annita, then she went twice as far as Annita. So we divide $48 \div (2 + 1) = 48 \div 3 = 16$. So Annita went 16 miles and Angela went 32 miles. Now we need to find their speeds. Speed = Distance \div Time, so Annita's speed was 16 miles \div 2 hours = 8 mph, and Angela's speed was 32 miles \div 2 hours = 16 mph. $\boxed{\text{Angela}=16, \text{Annita}=8}$
6. If the perimeter of a rectangle is 54 cm, $l + w + l + w = 54$, where l = length and w = width. Now what if we want to look at just one length + width? It is HALF of the perimeter! So $l + w = \frac{54}{2} = 27$. Now we know the length is twice the width, so we divide $27 \div (2 + 1) = 27 \div 3 = 9$. So the width is 9 and the length is twice the width, so the length is 18. The area of a rectangle is length \times width, so area = $9 \times 18 = 162$. $\boxed{l=18, w=9, A=162}$
7. If there was 92 tons total, and then 28 tons were removed, then our total is now $92 - 28 = 64$. Now warehouse B has 6 tons less than 4 times the meat in warehouse A. If warehouse B had 6 MORE tons, then the total would be $64 + 6 = 70$, and then we could divide $70 \div (4 + 1) = 70 \div 5 = 14$. So Warehouse A has 14 tons and Warehouse B has $14 \times 4 = 56$. But it has 6 tons LESS than 4 times the meat in warehouse A, so B really has $56 - 6 = 50$. Now we need to put back the original 28 tons we took away from warehouse A, so now A has $14 + 28 = 42$. $\boxed{A=42, B=50}$
8. $\boxed{20}$
9. First let's find the total amount of money: $\$320 + \$180 = \$500$. If we want Sara to have three times as much money as Annika, than Annika would have $500 \div (3 + 1) = 500 \div 4 = \125 and Sara will have $\$125 \times 3 = \375 . So Annika has to give Sara $180 - 125 = \boxed{\$55}$.
10. This problem was omitted because it was too hard. The correct solution would have been $A = 122.5$ and $B = 37.5$.