



Math Olympiad and Problem Solving Programs  
E120 - Honors Algebra Problem Solving  
Problem Set 11.1 - Proportions

Name:

Date:

1.  $\boxed{\$456}$
2.  $\boxed{27}$
3.  $\boxed{1.2 \text{ kg}}$
4.  $\boxed{24}$
5. The speed and the time are INVERSELY proportional. So our equation is  $\text{speed}_1 \times \text{time}_1 = \text{speed}_2 \times \text{time}_2$ . So our equation becomes:  $50 \times 18 = x \times 15 \Rightarrow x = \frac{50 \times 18}{15} = \boxed{60 \text{ km/h}}$
6. If 7 cleaners can clean in 8 hours, in order to get it done in half the time, we need twice the workers. The question asks "how many MORE cleaners," so we need  $\boxed{7}$  more cleaners.
7. The farmer wants the food to last  $\frac{3}{2}$  as long as it is already, so he needs to keep  $\frac{2}{3}$  of the sheep. So he will keep  $\frac{2}{3} \times 90 = 60$  sheep, meaning he will sell  $\boxed{30}$ .
8. The scale 1 : 40000 means that every 1 unit represents 40,000 real units. So if the map measures 1.4 cm by 0.35 cm, then the real dimensions of the lagoon as  $\times 40000$ . So the real length is  $1.4 \times 40000 = 56000$  cm, and the width is  $.35 \times 40000 = 14000$  cm. There are 100 cm in every m, so  $56000 \text{ cm} = 560$  m, and  $14000 \text{ cm} = 140$  m.  $\boxed{560 \text{ m by } 140 \text{ m}}$
9. Since  $\frac{3}{4}$  of the men are present, it will take  $\frac{4}{3}$  the time. So it will take  $8 \times \frac{4}{3} = 10\frac{2}{3}$  hours. The question asks "how much MORE time," so we find that it will take  $10\frac{2}{3} - 8 = 2\frac{2}{3}$  hours more to put up the fence.  $\boxed{2 \text{ hrs and } 40 \text{ min -OR- } 200 \text{ min}}$
10.  $\boxed{15}$