

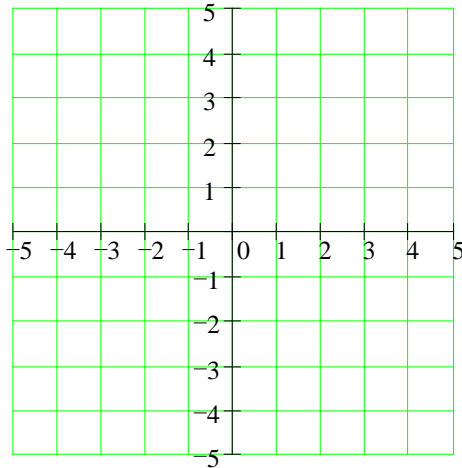
## Review Exercises (Ch. 5)

1)

a) UNDERSTAND THE PROBLEM

We are seeking the sum of the distances between the points (2,3) and (-5,1) and (-5,1) and (1,-2).

b) VISUALIZE THE PROBLEM



c)

Let  $d_1$  denote the distance between the points (2,3) and (-5,1).  
Let  $d_2$  denote the distance between the points (-5,1) and (1,-2).  
We are seeking the sum  $d_1 + d_2$ .

d) WRITE EQUATION(S)

Recall that the distance  $d$  between any two points  $(x_1, y_1)$  and  $(x_2, y_2)$  is

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ . (See FACT 2.10). We now have

$$d_1 = \sqrt{[(-5) - 2]^2 + (1 - 3)^2}$$

$$d_2 = \sqrt{[1 - (-5)]^2 + [(-2) - 1]^2}$$

$$d_1 + d_2 = \sqrt{[(-5) - 2]^2 + (1 - 3)^2} + \sqrt{[1 - (-5)]^2 + [(-2) - 1]^2}$$

e) SOLVE EQUATION(S)

$$d_1 + d_2 = \sqrt{[(-5) - 2]^2 + (1 - 3)^2} + \sqrt{[1 - (-5)]^2 + [(-2) - 1]^2}$$

$$= \sqrt{(-7)^2 + (-2)^2} + \sqrt{(6)^2 + (-3)^2}$$

$$= \sqrt{49 + 4} + \sqrt{36 + 9}$$

$$= \sqrt{53} + \sqrt{45}$$

$$d_1 + d_2 \approx 14$$

f) ANSWER THE QUESTION

The pilot has flown a distance of approximately 14 “Gridville” blocks.

g) CHECK YOUR ANSWER

If you determined the both distances on the grid as one would determine distance on a map (according to scale), you would find that their sum, when lined up along the  $x$ -axis, ends up close to the point (14,0).

3)

a) We know that Sid and Joanne can finish this job in less than 2 hours because we already know Sid can do it in 2 hours working alone. Even though Joanne isn't nearly as skillful, we still know that her help in working with Sid will cause the job to be done in less than 2 hours.

b) UNDERSTAND THE PROBLEM

We are seeking to find the amount of time it will take for Sid and Joanne to complete a job working together knowing that it takes Sid 2 hours to complete it working alone and that it takes Joanne 6 hours to complete it working alone.

VISUALIZE THE PROBLEM

You shouldn't need to draw a picture for this problem.

ASSIGN VARIABLE(S)

Let  $t$  be the time (in hrs) it takes for Sid and Joanne to complete the job working together.

WRITE EQUATION(S)

Sid's work rate is  $\frac{1 \text{ job}}{2 \text{ hrs}} = \frac{1}{2} \frac{\text{job}}{\text{hr}}$ . So Sid can complete  $\frac{1}{2}t$  jobs in  $t$  hours.

Likewise, Joanne's work rate is  $\frac{1 \text{ job}}{6 \text{ hrs}} = \frac{1}{6} \frac{\text{job}}{\text{hr}}$ , which implies she can complete  $\frac{1}{6}t$  jobs in  $t$  hours. Since Sid and Joanne are working together to complete *one* job, we add their work rates to obtain the equation  $\frac{1}{2}t + \frac{1}{6}t = 1$ .

SOLVE EQUATION(S)

$$\frac{1}{2}t + \frac{1}{6}t = 1$$

$$\frac{3}{6}t + \frac{1}{6}t = 1 \quad \text{Get a common denominator}$$

$$\frac{4}{6}t = 1$$

$$\frac{2}{3}t = 1$$

$$t = \frac{3}{2} = 1.5$$

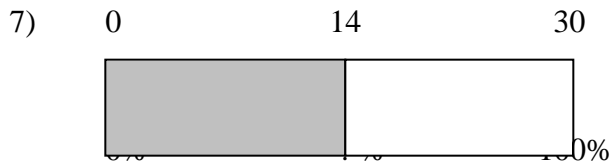
ANSWER THE QUESTION

It will take Sid and Joanne 1.5 hours to complete the job working together.

CHECK YOUR ANSWER

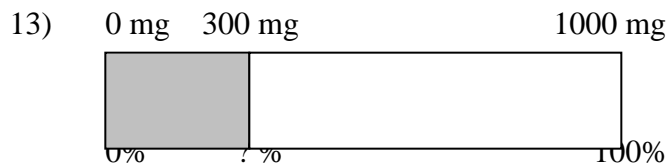
See part (a) of this problem.

5)  $\frac{\text{part}}{\text{whole}} = \text{percent}$   
 $\frac{\text{part}}{\text{whole}} \text{ whole} = \text{percent whole}$   
 $\text{part} = \text{percent whole}$

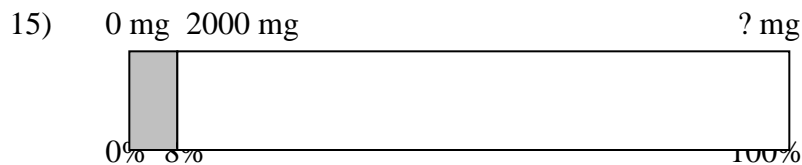


9)  $\frac{\text{part}}{\text{whole}} = \text{percent}$   
 $\frac{14}{30} = \text{percent}$   
 $\frac{14}{30} \cdot 100 = 46.67\% \approx 47\%$

11)  $15\% = 0.15$   
 $\frac{\text{part}}{\text{whole}} = \text{percent}$   
 $\frac{\text{part}}{72} = 0.15$   
 $\text{part} = 0.15 \cdot 72$   
 $\text{part} = 10.8$



$\frac{\text{part}}{\text{whole}} = \text{percent}$   
 $\frac{300 \text{ mg}}{1000 \text{ mg}} = \text{percent}$   
 $\frac{300 \text{ mg}}{1000 \text{ mg}} = 0.3 = 30\%$

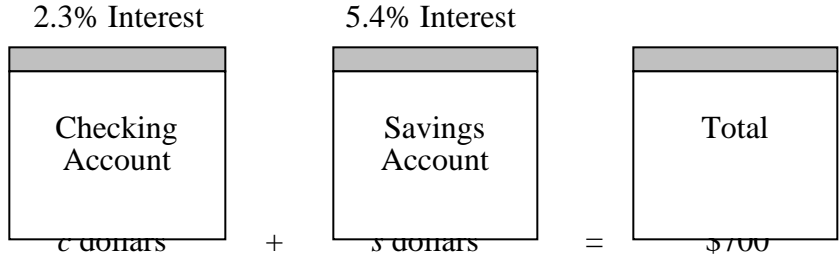




Graph  $Y_2 = (-5/7)X + 13/7$       $v = -\frac{5}{7}v + \frac{13}{7}$  from 2<sup>nd</sup> equation

d) By graphing, we can conclude  $p = 0.5$  and  $v = 1.5$ . Thus the customer buys 0.5 lbs of peanut butter fudge and 1.5 lbs of vanilla fudge.

23)



Let  $c$  be the total amount of money deposited in the checking account (\$).  
 Let  $s$  be the total amount of money deposited in the savings account (\$).  
 From the problem we have

$$c + s = 700$$

$$0.023c + 0.054s = 34.30$$

A total of \$700 was invested

Annual interest of \$34.30 was earned

$$s = 700 - c$$

$$0.023c + 0.054(700 - c) = 34.30$$

$$0.023c + 37.8 - 0.054c = 34.30$$

$$-0.031c + 37.8 = 34.30$$

$$-0.031c = -3.5$$

$$c = 112.90$$

$$s = 700 - 112.90 = 587.10$$

Approximately \$112.90 was deposited in the checking account.  
 Approximately \$587.10 was deposited in the savings account.