② (7, 1)

(8, 1.1)

(9, 1.2)

a) (10, 1.3)

let x rep speed (km/h

let y rep stride length (m)

b) $m = \dfrac{y_2 - y_1}{x_2 - x_1}$ | b

$\quad y = mx + b$

$\quad = \dfrac{1.1 - 1.0}{8 - 7}$ | $1 = 0.1(7) + b$

$\quad 1 - 0.7 = b$

$\quad = \dfrac{0.1}{1}$ | $0.3 = b$

$m = 0.1$

$\boxed{y = 0.1x + 0.3}$

c) $y = 2.1$

$y = 0.1x + 0.3$

$2.1 = 0.1x + 0.3$

$2.1 - 0.3 = 0.1x$

$\dfrac{1.8}{0.1} = \dfrac{0.1x}{0.1}$

$18 = x$

km/h

d) 10 min $= \dfrac{10}{60}$ hours

$\quad = \dfrac{1}{6}$ hrs

$\quad \doteq 0.167$

$\dfrac{18 \text{km}}{\text{h}} \times \dfrac{1}{6}$ hr

$= 3$ km

18 km/h × 0.167 h

④ (2, 175)
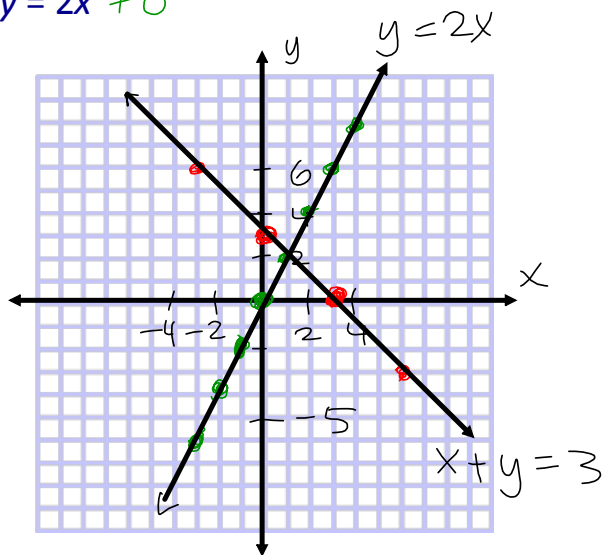
(52, 150)

4.9 Linear Systems

$$\frac{rise}{run} \quad \frac{+2}{1}$$

Graph each of the following on the grid below:

$y = 2x + 0$

$y = 2x$

$x + y = 3$

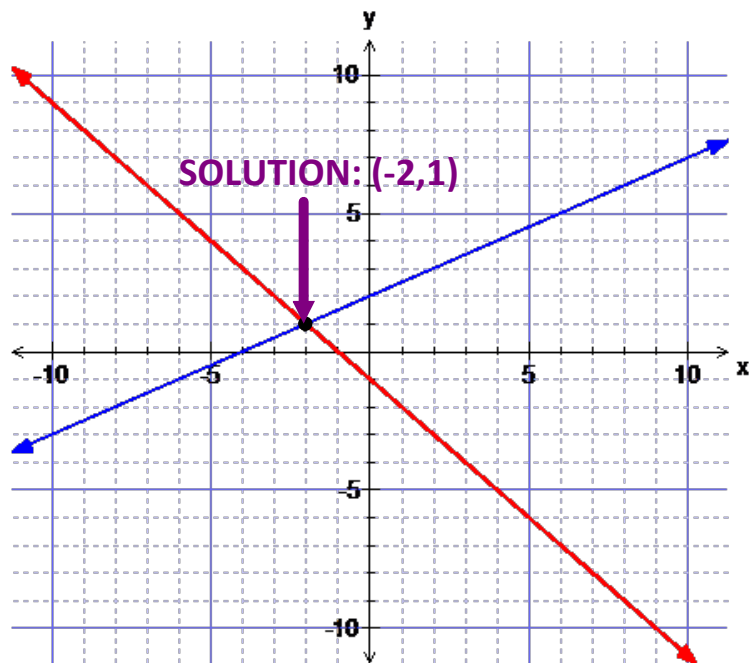x-int $(y = 0)$

$x = 3$

y-int $(x = 0)$

$y = 3$

$x + y = 3$

They (cross) Intersect

"Solution" $(1, 2)$

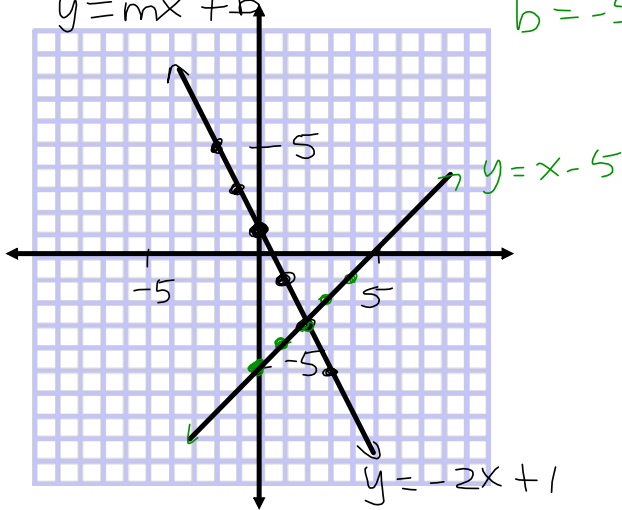System of linear equations: a set of equations (at least two)

Solution of a linear system: a point that satisfies both equations in a linear system --> the point of intersection

→ Point of Intersection

Ex. 1 Solve each linear system graphically. Check part (a).

a) $y = -2x + 1$ $y = x - 5$ → $m = 1$

$y = mx + b$ $b = -5$

$\dfrac{-2}{1}$ ← down

← right

$y = x - 5$

$y = -2x + 1$

Solution: $(2, -3)$

Check by substituting the solution in BOTH equations:

$y = -2x + 1$		$y = x - 5$	
LS = y	RS = -2x + 1	LS = y	RS = x - 5
y	$-2x + 1$	y	$x - 5$
$= -3$	$= -2(2) + 1$	$= -3$	$= 2 - 5$
	$= -4 + 1$		$= -3$
	$= -3$		
LS = RS		LS = RS	

∴ LS = RS
for both
equations

∴ $(2, -3)$
is the
solution

c) *y = 2x - 5*   **4x - 2y - 6 = 0**

$b = -5$

$m = \dfrac{2}{1}$

$4x - 2y = 6$

X-Int $= \dfrac{6}{4} = \dfrac{3}{2} = 1.5$

Y-Int $= -3$
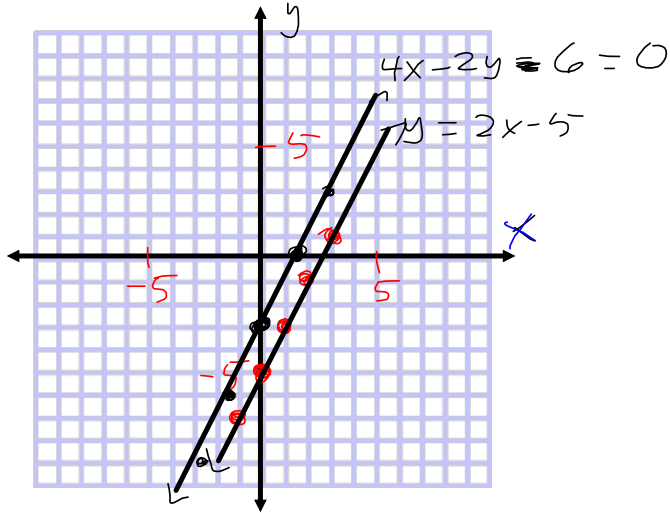
$4x - 2y = 6 = 0$

$y = 2x - 5$

No Solution
(Since lines are parallel)

|

$\underline{\text{X-Int}}$ $y = 0$

$4x - 2y = 6$

$4x \boxed{-2(0)} = 6$

$\dfrac{4x}{4} = \dfrac{6}{4}$

$x = \dfrac{3}{2}$

$x = 1.5$

$\underline{\text{Y-Int}}$ $(x = 0)$

$\dfrac{4(0) - 2y}{-2} = \dfrac{6}{-2}$

$y = -3$

$4x - 2y - 6 = 0$

$\dfrac{4x}{2} - \dfrac{6}{2} = \dfrac{2y}{2}$

$2x - 3 = y$

$y = 2x - 5$ $2x - 3 = y$

Slopes are Same

$\therefore$ parallel lines

$\rightarrow$ No Solution

Gillian wants to join a website that allows its users to share music files. SHAREIT charges a $6 membership fee, plus $0.75 for each downloaded song. FILES 'R' US charges $1.25 per downloaded song. How can Gillian determine which website she should join?

Create a system, or set of two, linear equations to model the situation.

Independent = # of songs
Dependent = Cost

Step 1: Let statements

let 'x' rep the # of songs downloaded
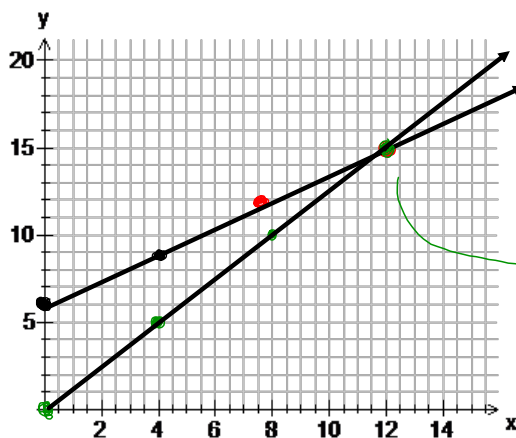let 'y' rep the Cost

Step 2: Equations

SHARE IT $y = 0.75x + 6$

FILES R US $y = 1.25x$

Step 3: Graph both lines on the same grid

FILES R US
SHAREIT

5 song
$y = 0.75(4) + 6$
$= 9$

Solution
(12, 15)

Step 4: When is the cost the same? What else can you say about SHAREIT and FILES'R'US
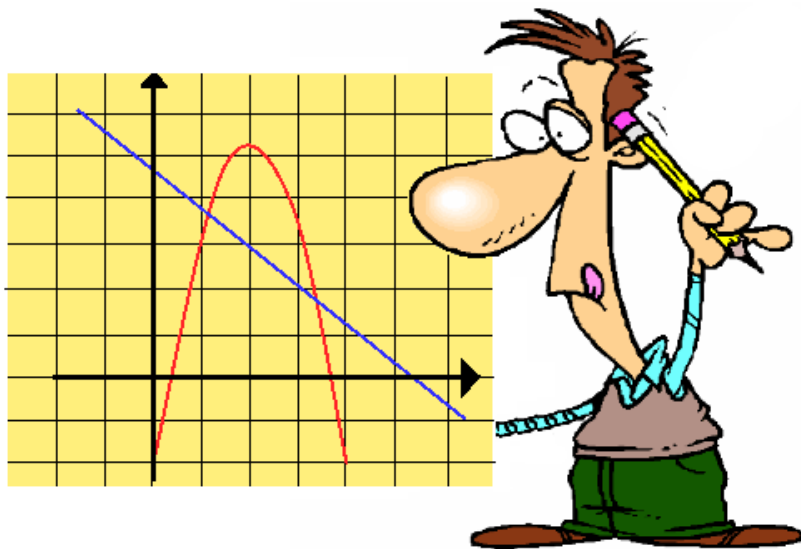
Download 12 Songs
The cost is the Same
for both companies

Choose Files R us
→ Download less
than 12

Choose Share It
if you download
more than 12

Homework
p.348 C2, 1,2, 9-10

Homework
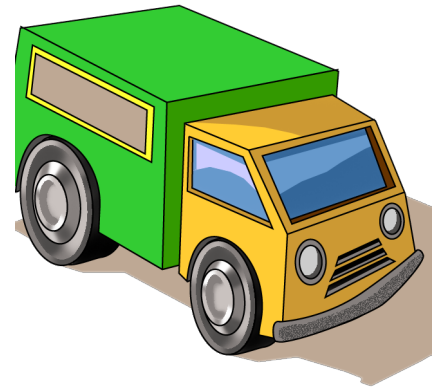## p.348 C2, 1,2, 9-10

Ex. 2:

Two companies rent trucks.

Company A charges $80.00 for the truck, plus $0.20/km
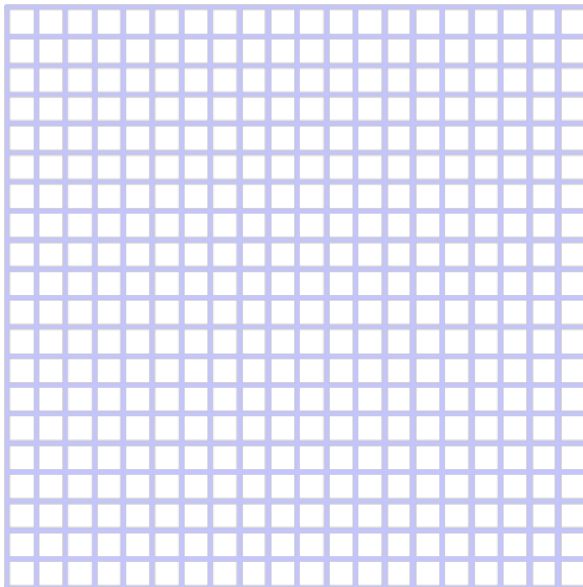
Company B charges $0.60/km.

a) Write an equation for each company's rental cost in terms of the distance driven.

company A

company B

b) Graph both equations on the same axes.

c) Find the coordinates of the point of intersection.

d) Explain the meaning of the point of intersection.

e) Which company is cheaper if you drive 150 km? or 250 km?