10-23-13 Quiz 7 POSTED THURSDAY (10-24)
DUE next Monday (E.C.)
" Following "

7.6 GRID

exercise	problem
1	1, 3
2	5
3	read

7.7 GRID variation DIRECT, INVERSE.
students like this topic.

EX	problem	
1	7, 9	DIRECT
2	11, 13	
3	23	
4	15, 17	INVERSE
5	31	

→ next week

MATH XL: CH 3, 7, 4, 5, 6, 8, 9.
Only.

Test 2 ←

Due Mon 10-28 or Mon 11-1 Quiz 7 7.3, 7.4, 7.5 (POSTED THURSDAY post Date 10-24-13.

Due Mon 11-1 Quiz 8 7.6, 7.7, 4.1, 4.2, 4.3.

7.6 Graphing in 2-D

Like section 7.5.

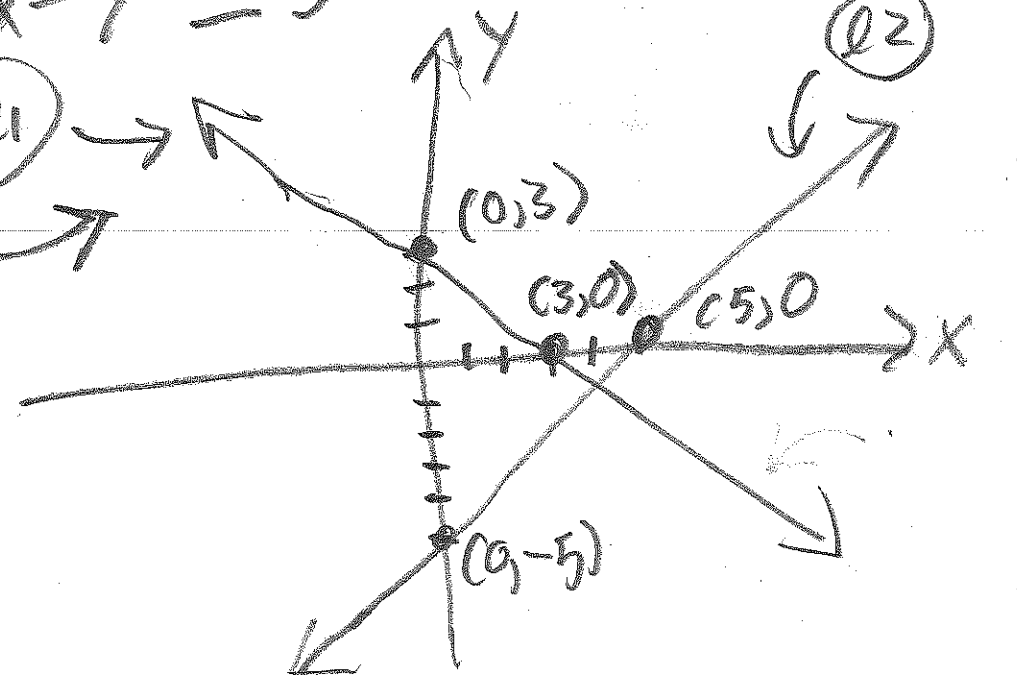
Use 7.5 methods twice and graph.

(1.) $x+y \leq 3$ line 1 → $x+y=3$ (l1)

$x-y \leq 5$ line 2 → $x-y=5$ (l2)

(A) Graph lines (l1) →

(B) Use test points or common sense to shade.



$x+y=3$ line 1

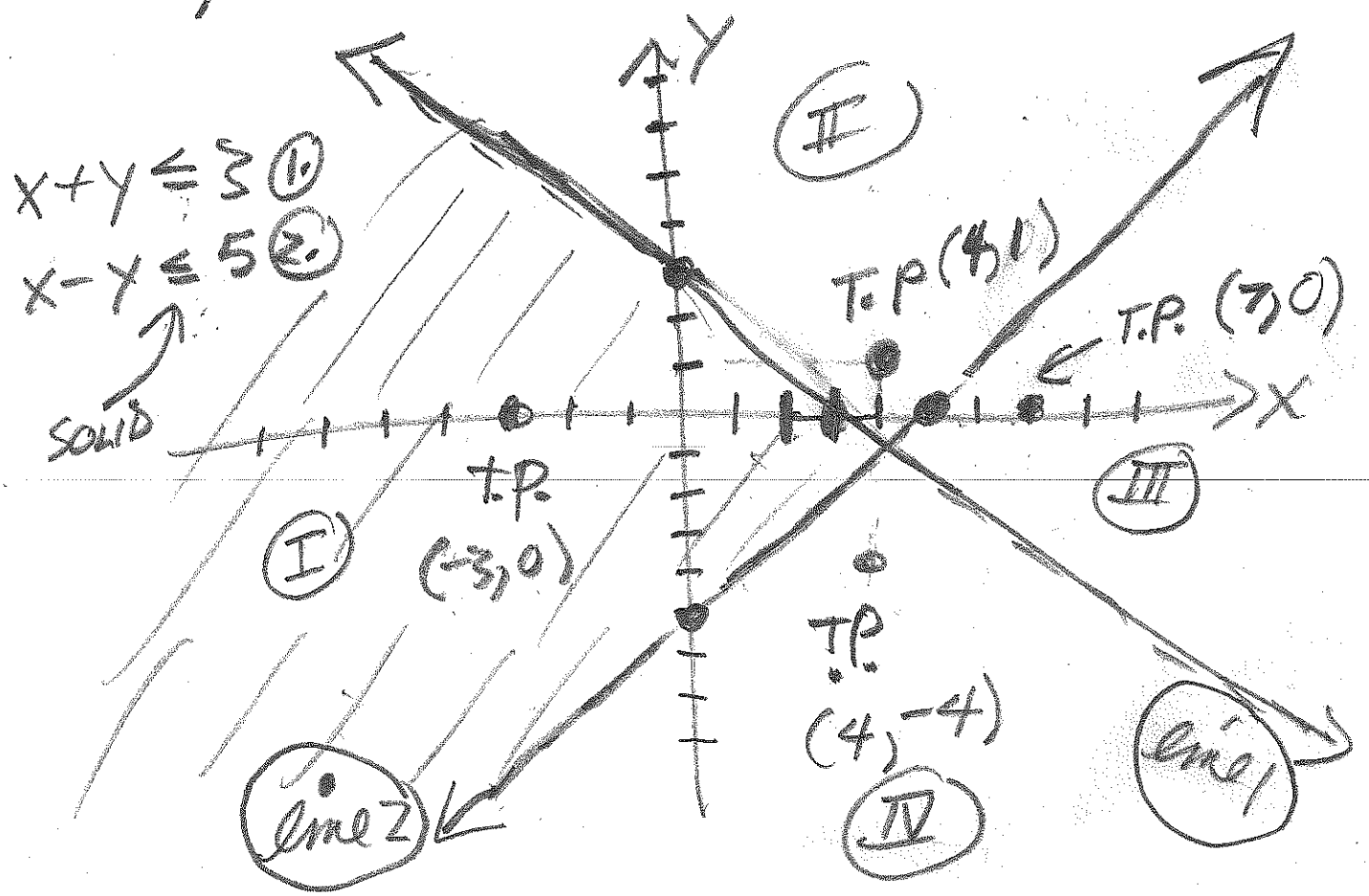
$x=0 \Rightarrow y=3 : (0,3)$

$y=0 \Rightarrow x=3 : (3,0)$

$x-y=5$ line 2

$x=0 \Rightarrow -y=5 \Rightarrow y=-5 : (0,-5)$

$y=0 \Rightarrow x=5 \Rightarrow x=5 : (5,0)$



(4

TRY EACH T.P. IN EACH

$\frac{1}{4}$ SLICE

T.P. IN (I.) (-3, 0) ↓

T.P IN (II.) (4, 1) CHECK

T.P IN (III.) (7, 0) THEM

T.P IN (IV.) (4, -4) ALL

(-3, 0) → $-3 + 0 \leq 3$ T

(I.) → $-3 - 0 \leq 5$ T } 2 TRUES.

2 TRUES ⇒ STOP & SHADE (I).

FOR FUN CHECK: (II) (4, 1)

DO NOT SHADE (II)

$4 + 1 \leq 3$ (F)

$4 - 1 \leq 5$ T

2.6

(5.0)

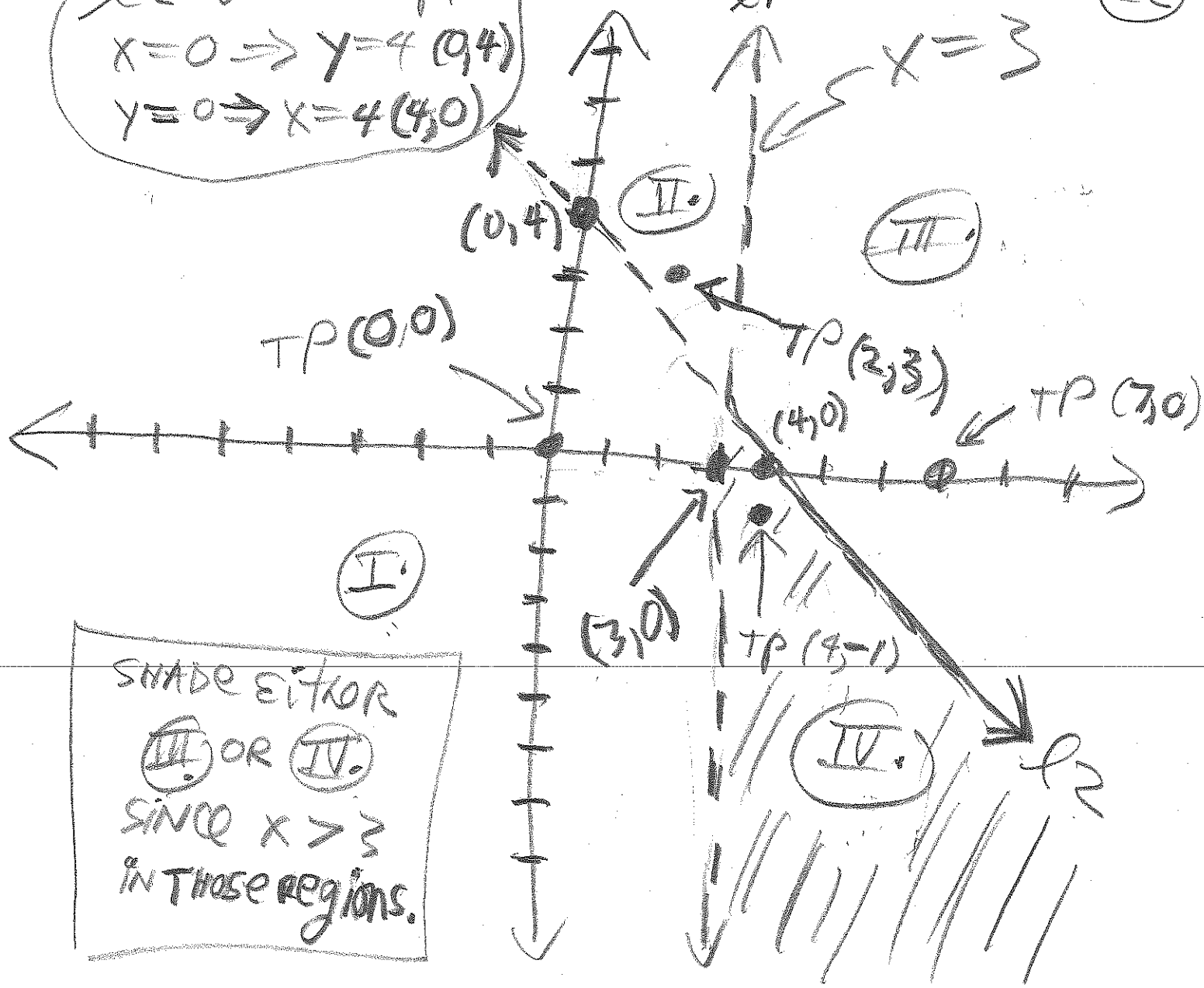
$x \geq 3 \rightarrow x = 3$ (l1)

$x + y \leq 4 \rightarrow x + y = 4$ (l2)

l2 use intercepts

$x = 0 \Rightarrow y = 4$ (0,4)

$y = 0 \Rightarrow x = 4$ (4,0)



SHADE either III. or IV. since $x \geq 3$ in those regions.

Start by checking at III:

(III) $+p(7,0)$

(6)

1. $x > 3 \Rightarrow 7 > 3$ (T)

2. $x + y \leq 4 \Rightarrow 7 + 0 \leq 4$ (F)

Thus shade (IV).

Confirm (IV):

$+p(4,-1)$

1. $x > 3 \Rightarrow 4 > 3$ (T)

2. $x + y \leq 4 \Rightarrow 4 + (-1) \leq 4$ (T)

$\geq$ Trues in (IV).

means shade (IV).

7.7 Variation

(A) $y = k \cdot x$ **direct**

x bigger $\Rightarrow$ y larger

(B) $y = \frac{k}{x}$ **inverse**

x bigger $\Rightarrow$ y smaller

since x is in the **denominator**.

k = variation constant

(does not change)

(1) $y = 40$ when $x = 8$

GIVEN: direct $\rightarrow$ $y = k \cdot x$

$40 = k \cdot 8$

$40 = 8k$

$5 = k$

$y = 5 \cdot x$ ANSWER

FIND y when $x = 2$:

$y = 5 \cdot 2 = 10$

FOLLOW UP QUESTION

(9.) $y = 1.75$ when $x = 0.25$

Given: direct → $y = kx$

$1.75 = k \cdot 0.25$

$1.75 = 0.25 \cdot k$

$\frac{1.75}{0.25} = \frac{0.25k}{0.25}$

$\frac{1.75}{0.25} = k$

$7 = k$

$0.25\overline{)1.75}$ → $\frac{3}{25}\overline{)175}$ → 7

-175

0

$y = 7 \cdot x$ answer

Find y when $x = 3$

$y = 7 \cdot 3 = 21$

Follow up question.

(11) $y = 0.3$ when $x = 0.5$

Given: direct $\rightarrow y = kx$

$0.3 = k \cdot (0.5)$

$0.3 = 0.5 \cdot k$

$\frac{0.3}{0.5} = \frac{0.5}{0.5} k$

$0.6 = k$

$0.5\overline{)0.3}$

0.6

$5\overline{)3.0}$

-30

$\boxed{y = 0.6x}$ or $\boxed{y = \frac{3}{5}x}$

NOTE: $0.6 = \frac{6}{10} = \frac{3}{5}$

what is y when $x = 2$?

$y = (0.6)(2) = 1.2$

Follow up ?

(23.) Direct:

Given: Direct → varies directly with

Employees paycheck p

number hours worked.

For 15 hours of work,

p = pay = $135

Find pay for 23 hours of work.

n = # hours worked

$$p = k \cdot n$$

$$135 = k \cdot 15$$

$$135 = 15 \cdot k$$

$$\frac{135}{15} = \frac{15k}{15} \rightarrow 9 = k$$

$$15\overline{)135}\quad 9$$

$$-135$$

$$0$$

$P = k \cdot n$

$P = 9 \cdot n$

when $n = 23$ hours

$P = 9 \cdot 23 = \$207$ → ANSWER

$\begin{array}{r} 23 \\ \times 9 \\ \hline 207 \end{array}$

inverse VARIATION:

(15.)

given: inverse → $Y = \frac{K}{X}$

$10 = \frac{K}{12}$

$12 \cdot 10 = \frac{12 \cdot K}{12}$

$120 = K$

answer

$Y = \frac{120}{X}$; WHEN $X = 3$, $Y = 60$ ← FOLLOW UP

31. p varies inversely with w

inverse $\Rightarrow p = \frac{k}{w}$

INFO: when $w = 2.4$ H,
$p = 440$ Hz $\left(\frac{\text{vib}}{\text{sec}}\right)$.

GOAL: FIND w when $p = 660$ Hz.

Step 1. FIND k $\quad 440 = \frac{k}{2.4}$

$2.4 \cdot 440 = 2.4 \cdot \frac{k}{2.4}$

$1056 = k$

$440 \times 2.4 = 1760 + 880 = 1056.0$

THUS: $p = \frac{1056}{w}$ ← EQUATION WE USE TO FIND OTHER P'S OR W'S.

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$K = 1056$ and $P = \frac{K}{W}$ (3)

(3b) step 2: $660 = \frac{1056}{W}$

FIND W BY CROSS-MULTIPLYING:

$\frac{660}{1} = \frac{1056}{W} \Rightarrow \frac{660}{1} \times \frac{1056}{W}$

$W \cdot 660 = 1 \cdot 1056$

$660W = 1056$

$W = \frac{1056}{660} = 1.6$ ft

ANSWER

$660\overline{)1056.0}$ → 1.6 ft

-660

3960

-3960

0

ANSWER:
$W = 1.6$ ft
WHEN $P = 660$ N

(14)

My Follow up:

Find P when w = 2 ft

$$P = \frac{k}{w}$$

$$P = \frac{1056}{2}$$

$$P = 528 \text{ Hz}$$

Makes sense since:

P = 440 Hz when w = 2.4 ft.

if w decreases, P will increase:

$$P = \frac{1056}{2.4} = 528 \text{ Hz} > 440 \text{ Hz}$$

2.1

(15)

$400 < 528 < 660$ Hz

$\lambda = 2.4$ ft $\lambda = 2.0$ ft $\lambda = 1.6$ ft

$$p = \frac{k}{\lambda}$$

$p = \frac{k}{\text{LARGE}} \Rightarrow p$ IS SMALL

$p = \frac{k}{\text{SMALL}} \Rightarrow p$ IS LARGE