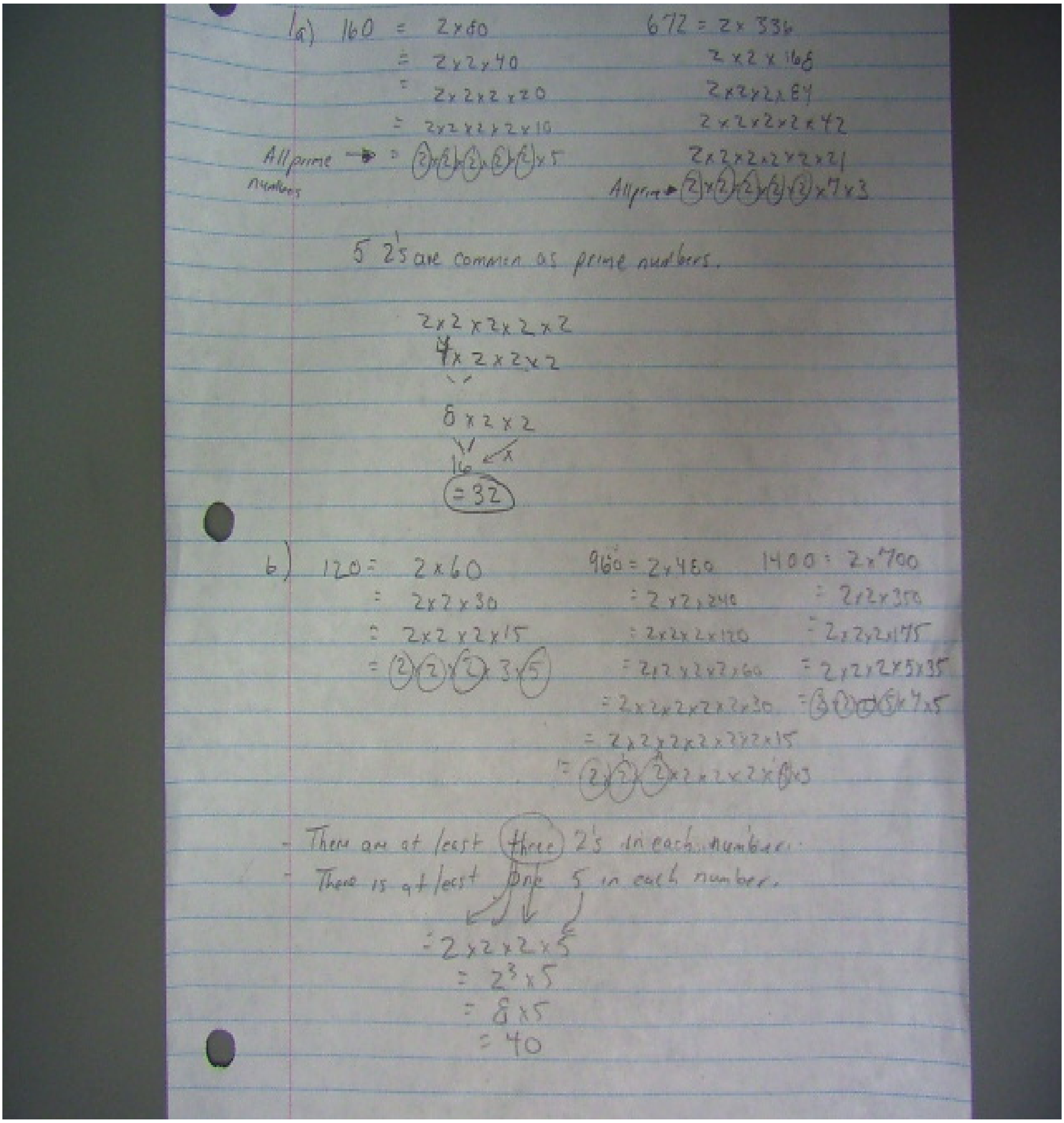


1a) $160 = 2 \times 80$

$= 2 \times 2 \times 40$

$= 2 \times 2 \times 2 \times 20$

$= 2 \times 2 \times 2 \times 2 \times 10$

All prime numbers → $= 2 \times 2 \times 2 \times 2 \times 2 \times 5$

$672 = 2 \times 336$

$2 \times 2 \times 168$

$2 \times 2 \times 2 \times 84$

$2 \times 2 \times 2 \times 2 \times 42$

$2 \times 2 \times 2 \times 2 \times 2 \times 21$

All prime → $2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 3$

5 2's are common as prime numbers.

$2 \times 2 \times 2 \times 2 \times 2$

$4 \times 2 \times 2 \times 2$

$8 \times 2 \times 2$

16 ← x

$\boxed{= 32}$

b) $120 = 2 \times 60$

$= 2 \times 2 \times 30$

$= 2 \times 2 \times 2 \times 15$

$= 2 \times 2 \times 2 \times 3 \times 5$

$960 = 2 \times 480$

$= 2 \times 2 \times 240$

$= 2 \times 2 \times 2 \times 120$

$= 2 \times 2 \times 2 \times 2 \times 60$

$= 2 \times 2 \times 2 \times 2 \times 2 \times 30$

$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 15$

$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 3$

$1400 = 2 \times 700$

$= 2 \times 2 \times 350$

$= 2 \times 2 \times 2 \times 175$

$= 2 \times 2 \times 2 \times 5 \times 35$

$= 2 \times 2 \times 2 \times 5 \times 7 \times 5$

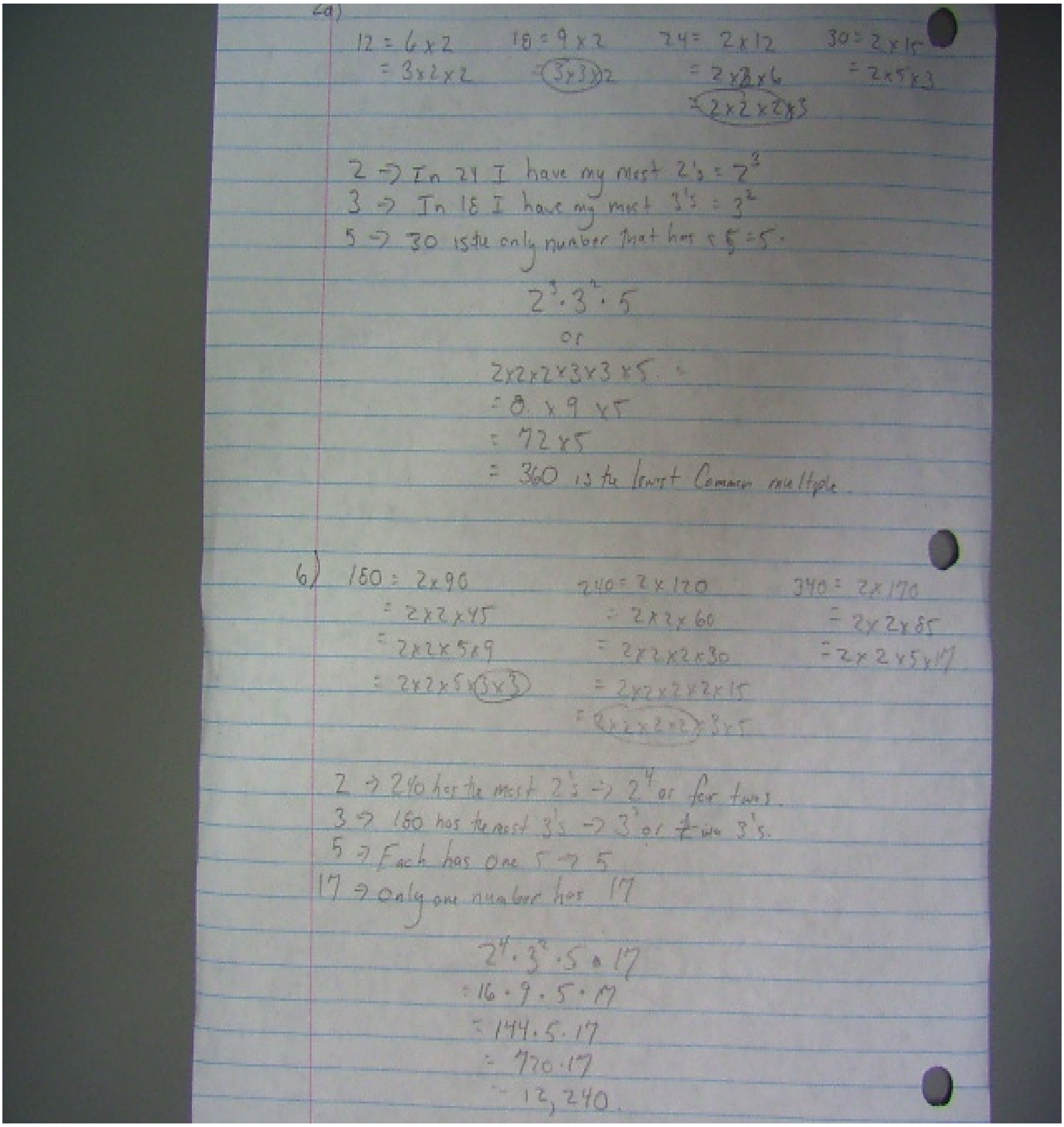
- There are at least three 2's in each number.
- There is at least one 5 in each number.

$= 2 \times 2 \times 2 \times 5$

$= 2^3 \times 5$

$= 8 \times 5$

$= 40$



2a)

$12 = 6 \times 2$
$= 3 \times 2 \times 2$

$18 = 9 \times 2$
$= \boxed{3 \times 3} \times 2$

$24 = 2 \times 12$
$= 2 \times 2 \times 6$
$= \boxed{2 \times 2 \times 2} \times 3$

$30 = 2 \times 15$
$= 2 \times 5 \times 3$

2 → In 24 I have my most 2's = 2^3
3 → In 18 I have my most 3's = 3^2
5 → 30 is the only number that has a 5 = 5.

$2^3 \cdot 3^2 \cdot 5$

or

$2 \times 2 \times 2 \times 3 \times 3 \times 5$
$= 8 \times 9 \times 5$
$= 72 \times 5$
$= 360$ is the lowest Common multiple.

6)

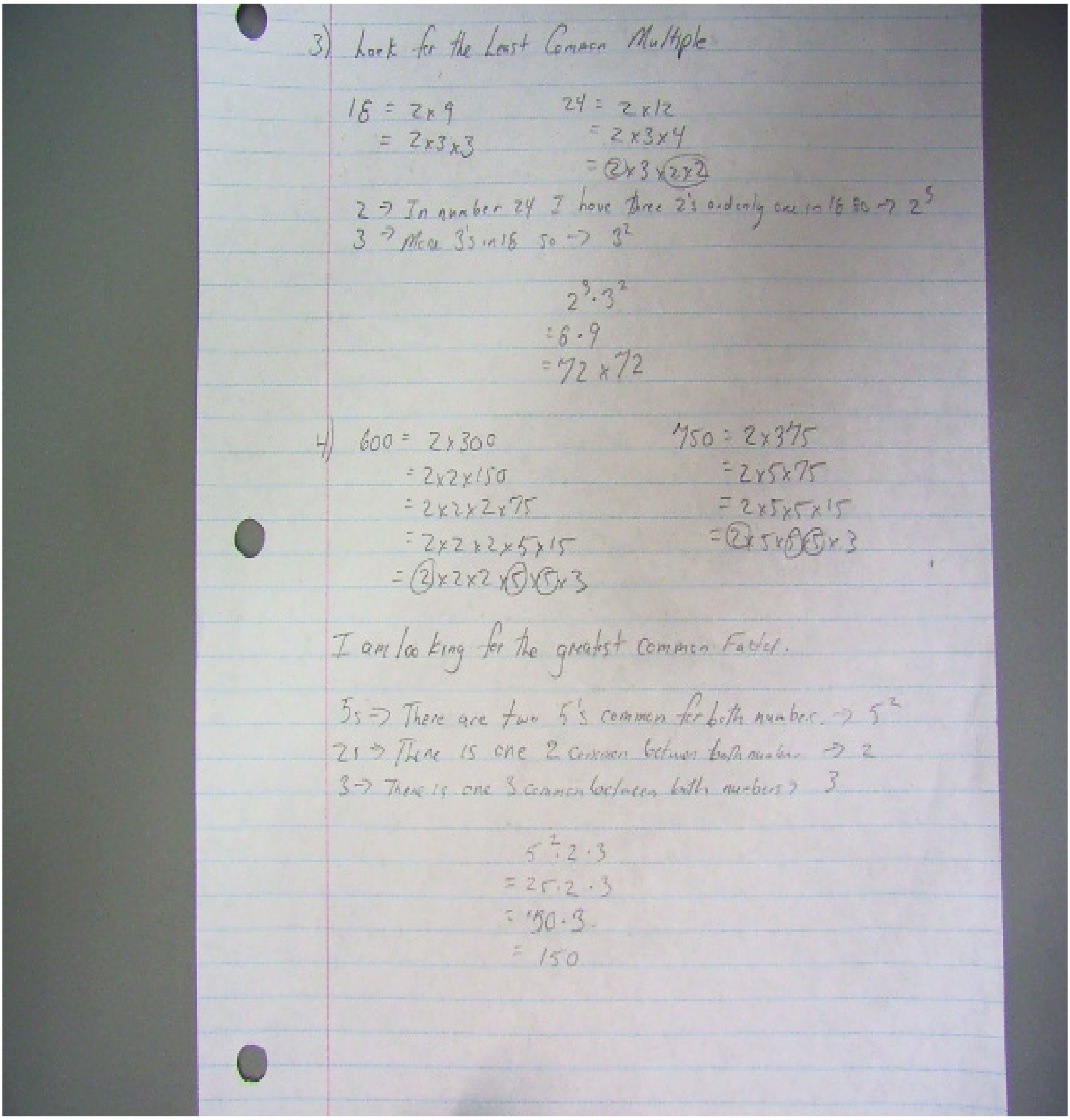
$160 = 2 \times 90$
$= 2 \times 2 \times 45$
$= 2 \times 2 \times 5 \times 9$
$= 2 \times 2 \times 5 \times \boxed{3 \times 3}$

$240 = 2 \times 120$
$= 2 \times 2 \times 60$
$= 2 \times 2 \times 2 \times 30$
$= 2 \times 2 \times 2 \times 2 \times 15$
$= \boxed{2 \times 2 \times 2 \times 2} \times 3 \times 5$

$340 = 2 \times 170$
$= 2 \times 2 \times 85$
$= 2 \times 2 \times 5 \times 17$

2 → 240 has the most 2's → 2^4 or four twos.
3 → 160 has the most 3's → 3^2 or two 3's.
5 → Each has one 5 → 5
17 → Only one number has 17

$2^4 \cdot 3^2 \cdot 5 \cdot 17$
$= 16 \cdot 9 \cdot 5 \cdot 17$
$= 144 \cdot 5 \cdot 17$
$= 720 \cdot 17$
$= 12,240.$



3) Look for the Least Common Multiple

18 = 2x9
= 2x3x3

24 = 2x12
= 2x3x4
$= \textcircled{2} \times 3 \times \textcircled{2 \times 2}$

2 → In number 24 I have three 2's and only one in 18 so → 2^3
3 → More 3's in 18 so → 3^2

$2^3 \cdot 3^2$
$= 8 \cdot 9$
$= 72$ x72

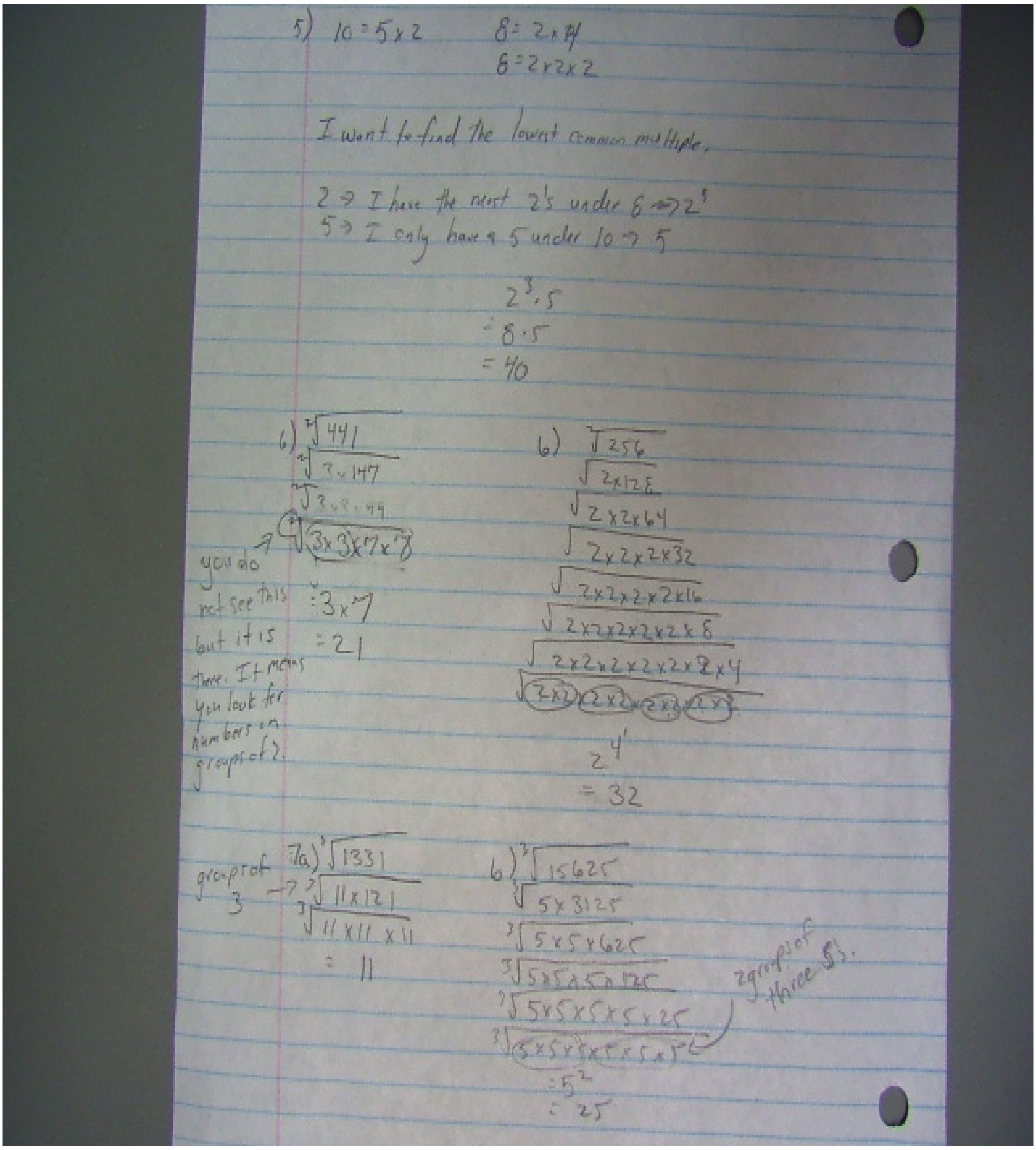
4) 600 = 2x300
= 2x2x150
= 2x2x2x75
= 2x2x2x5x15
$= \textcircled{2} \times 2 \times 2 \times \textcircled{5} \times \textcircled{5} \times 3$

750 = 2x375
= 2x5x75
= 2x5x5x15
$= \textcircled{2} \times 5 \times \textcircled{5} \times \textcircled{5} \times 3$

I am looking for the greatest common Factor.

5s → There are two 5's common for both number. → 5^2
2s → There is one 2 common between both number → 2
3 → There is one 3 common between both numbers → 3

$5^2 \cdot 2 \cdot 3$
$= 25 \cdot 2 \cdot 3$
$= 50 \cdot 3$
$= 150$



5) $10 = 5 \times 2$

$8 = 2 \times 4$

$8 = 2 \times 2 \times 2$

I want to find the lowest common multiple.

2 → I have the most 2's under 8 → 2^3

5 → I only have a 5 under 10 → 5

$2^3 \cdot 5$

$= 8 \cdot 5$

$= 40$

6) $\sqrt[2]{441}$

$\sqrt[2]{3 \times 147}$

$\sqrt[2]{3 \times 3 \times 49}$

$\sqrt[2]{3 \times 3 \times 7 \times 7}$

$= 3 \times 7$

$= 21$

you do not see this but it is there. It means you look for numbers in groups of 2.

6) $\sqrt{256}$

$\sqrt{2 \times 128}$

$\sqrt{2 \times 2 \times 64}$

$\sqrt{2 \times 2 \times 2 \times 32}$

$\sqrt{2 \times 2 \times 2 \times 2 \times 16}$

$\sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 8}$

$\sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 4}$

$\sqrt{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}$

2^4

$= 32$

groups of 3 →

7a) $\sqrt[3]{1331}$

$\sqrt[3]{11 \times 121}$

$\sqrt[3]{11 \times 11 \times 11}$

$= 11$

6) $\sqrt[3]{15625}$

$\sqrt[3]{5 \times 3125}$

$\sqrt[3]{5 \times 5 \times 625}$

$\sqrt[3]{5 \times 5 \times 5 \times 125}$

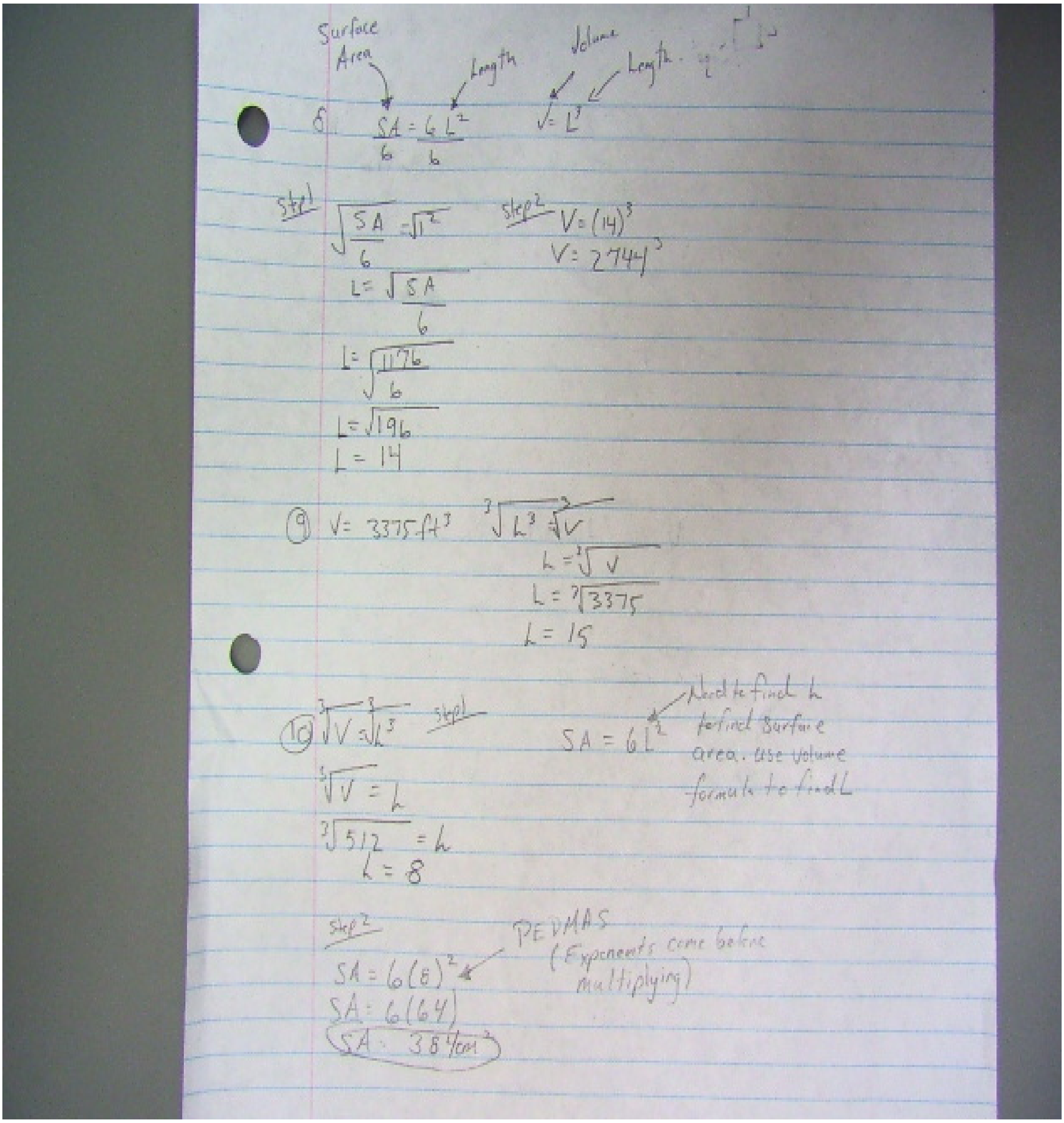
$\sqrt[3]{5 \times 5 \times 5 \times 5 \times 25}$

$\sqrt[3]{5 \times 5 \times 5 \times 5 \times 5 \times 5}$

2 groups of three 5's.

$= 5^2$

$= 25$



Surface Area

Length

Volume

Length

8. $\frac{SA}{6} = \frac{6L^2}{6}$ $V = L^3$

Step 1

$\sqrt{\frac{SA}{6}} = \sqrt{L^2}$

$L = \sqrt{\frac{SA}{6}}$

$L = \sqrt{\frac{1176}{6}}$

$L = \sqrt{196}$

$L = 14$

Step 2

$V = (14)^3$

$V = 2744^3$

⑨ $V = 3375 ft^3$ $\sqrt[3]{L^3}\ \sqrt[3]{V}$

$L = \sqrt[3]{V}$

$L = \sqrt[3]{3375}$

$L = 15$

⑩ $\sqrt[3]{V} = \sqrt[3]{L^3}$ Step 1

$\sqrt[3]{V} = L$

$\sqrt[3]{512} = L$

$L = 8$

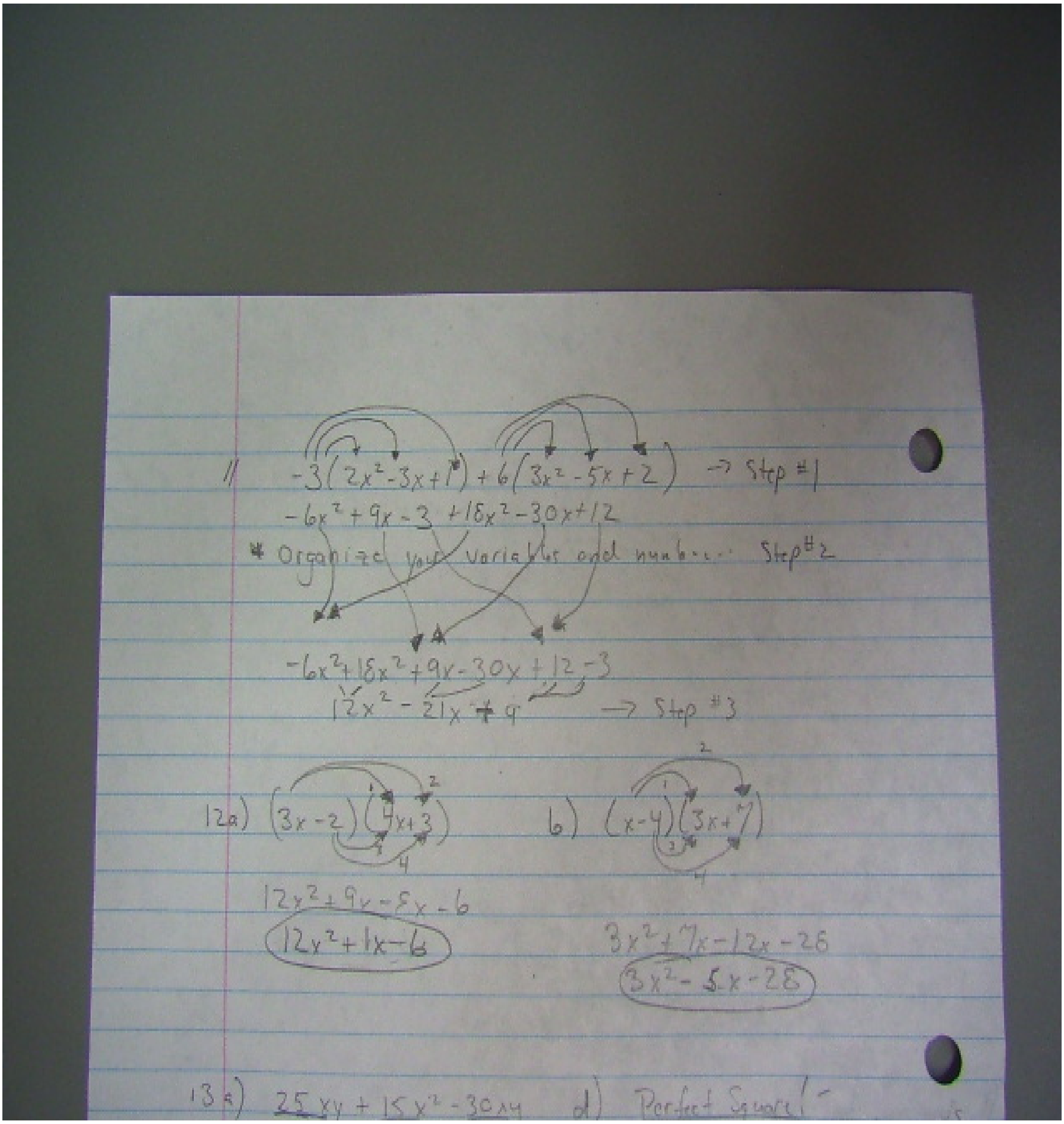
$SA = 6L^2$ Need to find L to find Surface area. Use volume formula to find L

Step 2

$SA = 6(8)^2$ PEDMAS (Exponents come before multiplying)

$SA = 6(64)$

$\boxed{SA = 384 cm^2}$



11 $-3(2x^2-3x+1)+6(3x^2-5x+2)$ → Step #1

$-6x^2+9x-3+18x^2-30x+12$

* Organize your variables and numbers Step #2

$-6x^2+18x^2+9x-30x+12-3$

$12x^2-21x+9$ → Step #3

12a) $(3x-2)(4x+3)$

1 2 3 4

$12x^2+9x-8x-6$

$\boxed{12x^2+1x-6}$

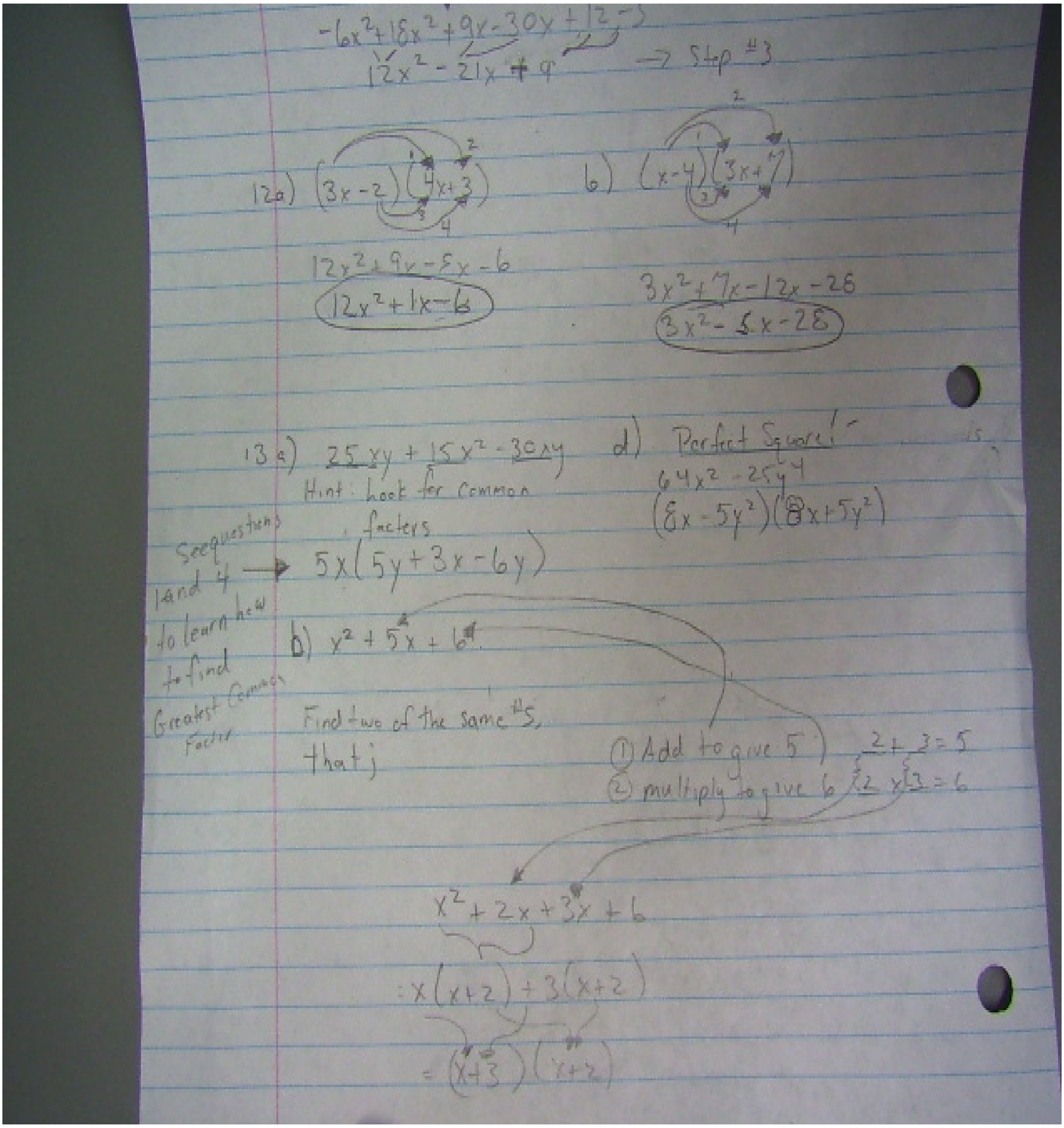
b) $(x-4)(3x+7)$

1 2 3 4

$3x^2+7x-12x-28$

$\boxed{3x^2-5x-28}$

13a) $\underline{25}xy+\underline{15}x^2-\underline{30}xy$ d) Perfect Square!



$-6x^2+18x^2+9x-30x+12-3$

$12x^2-21x+9$ → Stp #3

12a) $(3x-2)(4x+3)$

$12x^2+9x-8x-6$

$\boxed{12x^2+1x-6}$

b) $(x-4)(3x+7)$

$3x^2+7x-12x-28$

$\boxed{3x^2-5x-28}$

13a) $25xy+15x^2-30xy$

Hint: Look for common factors

See questions 1 and 4 to learn how to find Greatest Common Factor →

$5x(5y+3x-6y)$

d) Perfect Square!

$64x^2-25y^4$

$(8x-5y^2)(8x+5y^2)$

b) x^2+5x+6

Find two of the same #s, that;

① Add to give 5

② multiply to give 6

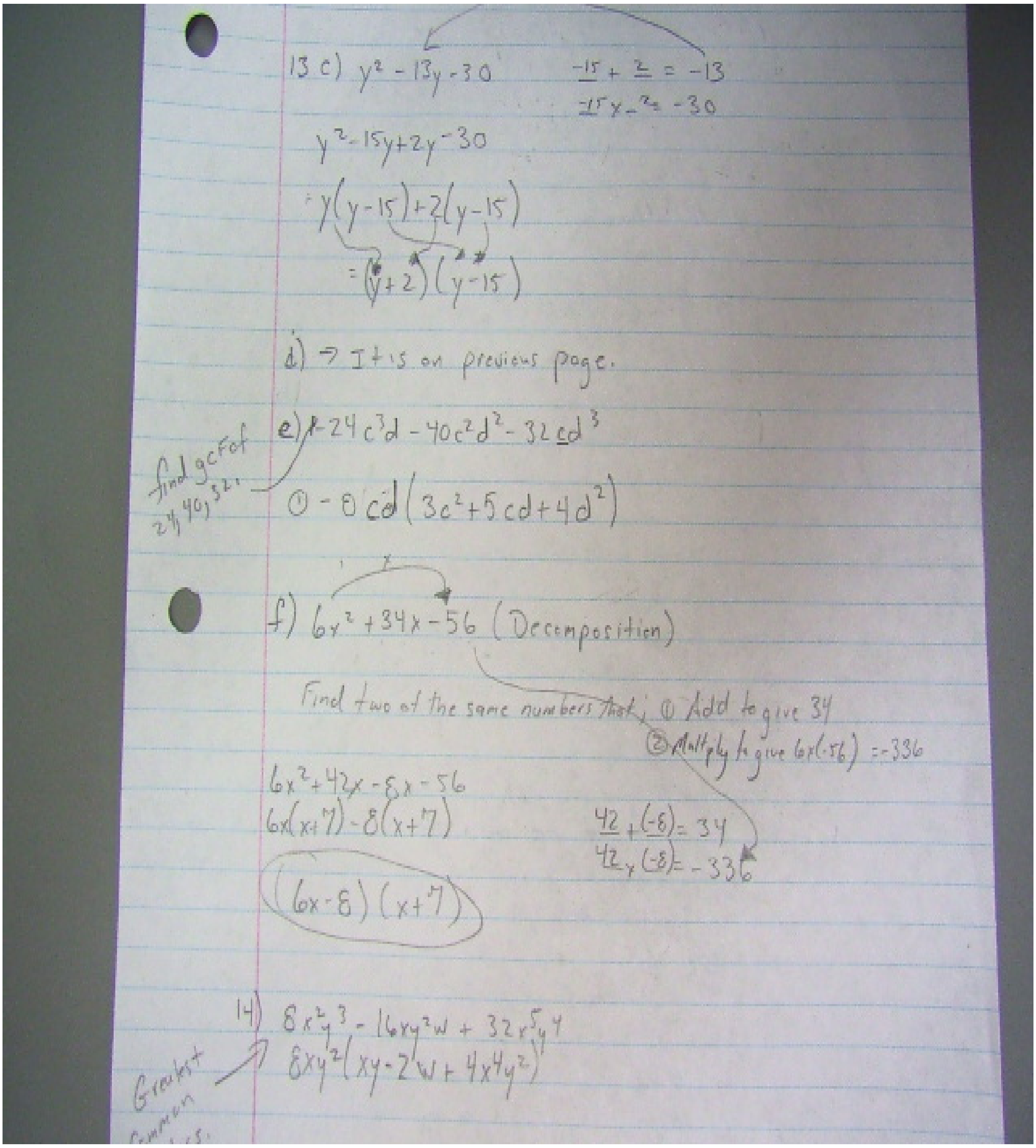
$2+3=5$

$2\times3=6$

$x^2+2x+3x+6$

$=x(x+2)+3(x+2)$

$=(x+3)(x+2)$



13 c) $y^2 - 13y - 30$

$\underline{-15} + \underline{2} = -13$

$\underline{-15} \times \underline{2} = -30$

$y^2 - 15y + 2y - 30$

$= y(y-15) + 2(y-15)$

$= (y+2)(y-15)$

d) → It is on previous page.

e) $-24c^3d - 40c^2d^2 - 32\underline{cd}^3$

find gcf of 24, 40, 32

① $-8cd(3c^2 + 5cd + 4d^2)$

f) $6x^2 + 34x - 56$ (Decomposition)

Find two of the same numbers that; ① Add to give 34

② Multiply to give $6 \times (-56) = -336$

$6x^2 + 42x - 8x - 56$

$6x(x+7) - 8(x+7)$

$\underline{42} + \underline{(-8)} = 34$

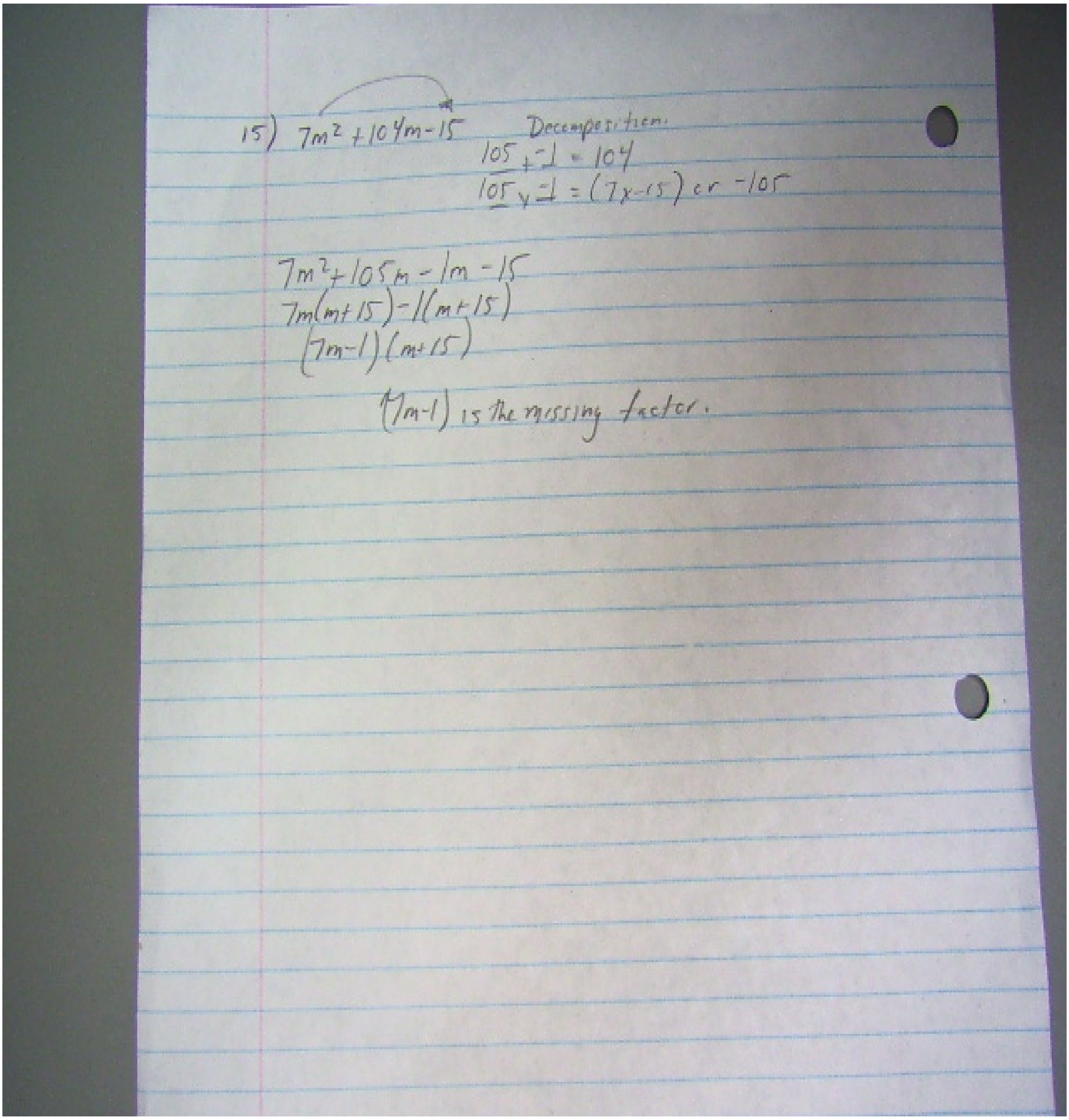
$42 \times (-8) = -336$

$(6x-8)(x+7)$

14) $8x^2y^3 - 16xy^2w + 32x^5y^4$

Greatest Common

$8xy^2(xy - 2w + 4x^4y^2)$



15) $7m^2 + 104m - 15$ Decomposition

$\underline{105} + \underline{-1} = 104$

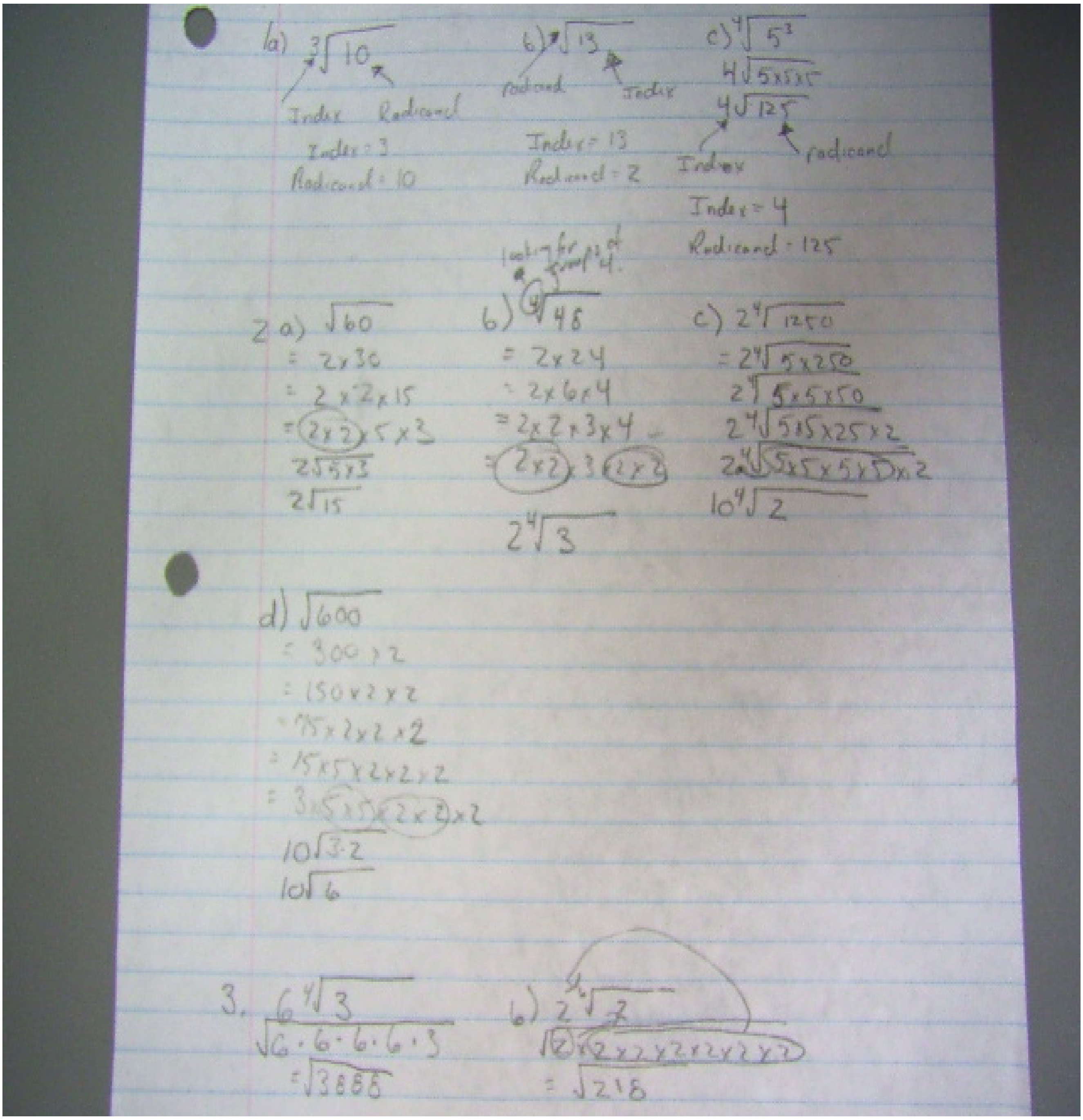
$\underline{105} \times \underline{-1} = (7x-15)$ or -105

$7m^2 + 105m - 1m - 15$

$7m(m+15) - 1(m+15)$

$(7m-1)(m+15)$

$(7m-1)$ is the missing factor.



1a) $\sqrt[3]{10}$

Index Radicand

Index = 3

Radicand = 10

b) $\sqrt{13}$

radicand Index

Index = 13

Radicand = 2

c) $\sqrt[4]{5^3}$

$4\sqrt{5\times5\times5}$

$4\sqrt{125}$

Index radicand

Index = 4

Radicand = 125

2 a) $\sqrt{60}$

$= 2\times30$

$= 2\times2\times15$

$= (2\times2)\times5\times3$

$2\sqrt{5\times3}$

$2\sqrt{15}$

looking for groups of 4.

b) $\sqrt[4]{48}$

$= 2\times24$

$= 2\times6\times4$

$= 2\times2\times3\times4$

$= (2\times2)\times3(2\times2)$

$2\sqrt[4]{3}$

c) $2\sqrt[4]{1250}$

$= 2\sqrt[4]{5\times250}$

$2\sqrt[4]{5\times5\times50}$

$2\sqrt[4]{5\times5\times25\times2}$

$2\sqrt[4]{(5\times5\times5\times5)\times2}$

$10\sqrt[4]{2}$

d) $\sqrt{600}$

$= 300\times2$

$= 150\times2\times2$

$= 75\times2\times2\times2$

$= 15\times5\times2\times2\times2$

$= 3\times(5\times5)\times(2\times2)\times2$

$10\sqrt{3\cdot2}$

$10\sqrt{6}$

3. $6\sqrt[4]{3}$

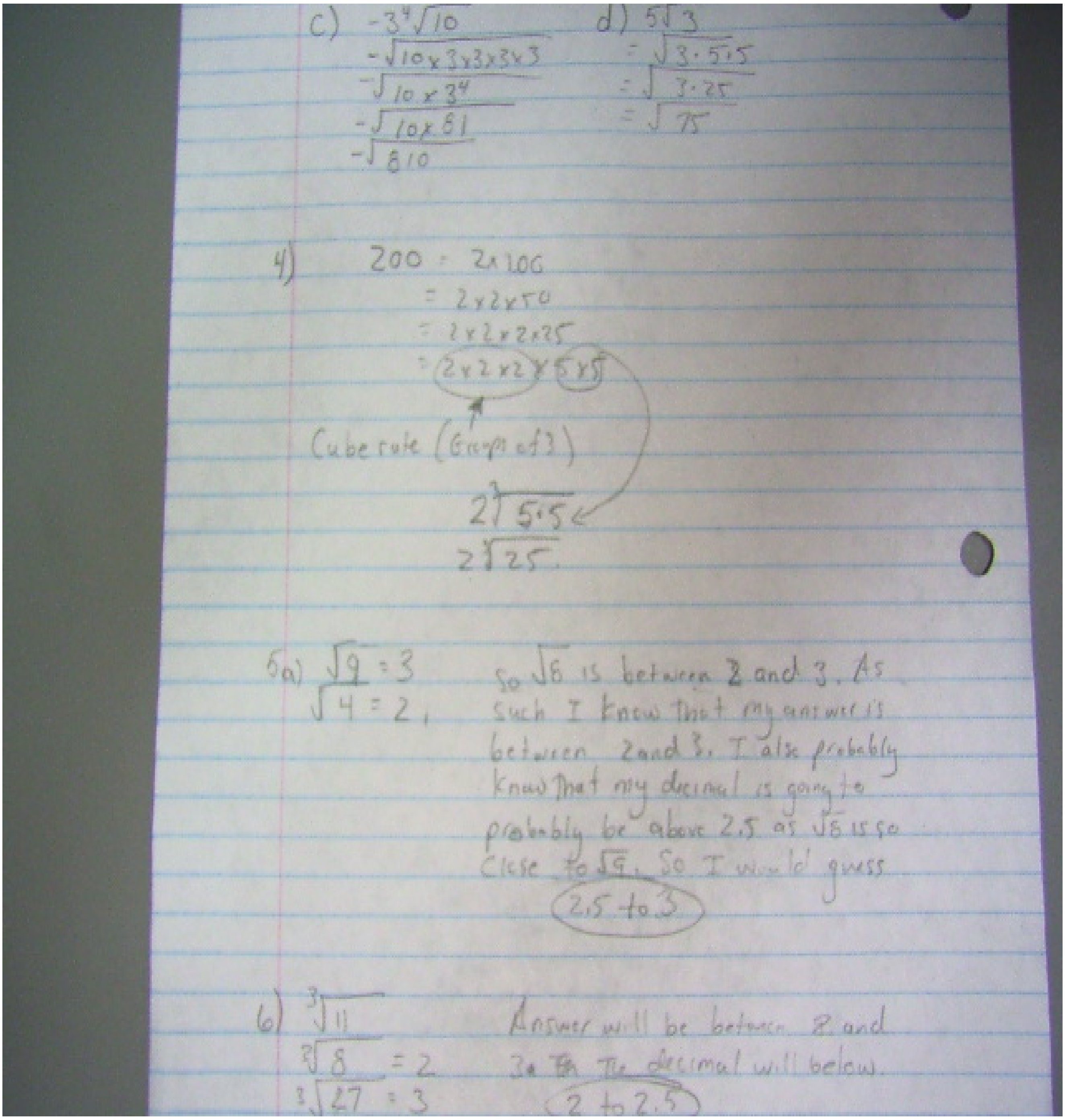
$\sqrt{6\cdot6\cdot6\cdot6\cdot3}$

$= \sqrt{3888}$

b) $2\sqrt[4]{2}$

$\sqrt{2\times2\times2\times2\times2\times2\times2\times2}$

$= \sqrt{218}$



c) $-3\sqrt[4]{10}$

$-\sqrt{10\times3\times3\times3\times3}$

$-\sqrt{10\times3^4}$

$-\sqrt{10\times81}$

$-\sqrt{810}$

d) $5\sqrt{3}$

$=\sqrt{3\cdot5\cdot5}$

$=\sqrt{3\cdot25}$

$=\sqrt{75}$

4) $200 = 2\times100$

$= 2\times2\times50$

$= 2\times2\times2\times25$

$= \boxed{2\times2\times2}\times\boxed{5\times5}$

Cube rute (Groups of 3)

$2\sqrt[3]{5\cdot5}$

$2\sqrt[3]{25}$.

5a) $\sqrt{9}=3$

$\sqrt{4}=2$,

So $\sqrt{8}$ is between 2 and 3. As such I know that my answer is between 2 and 3. I also probably know that my decimal is going to probably be above 2.5 as $\sqrt{8}$ is so close to $\sqrt{9}$. So I would guess

$\boxed{2.5 \text{ to } 3}$

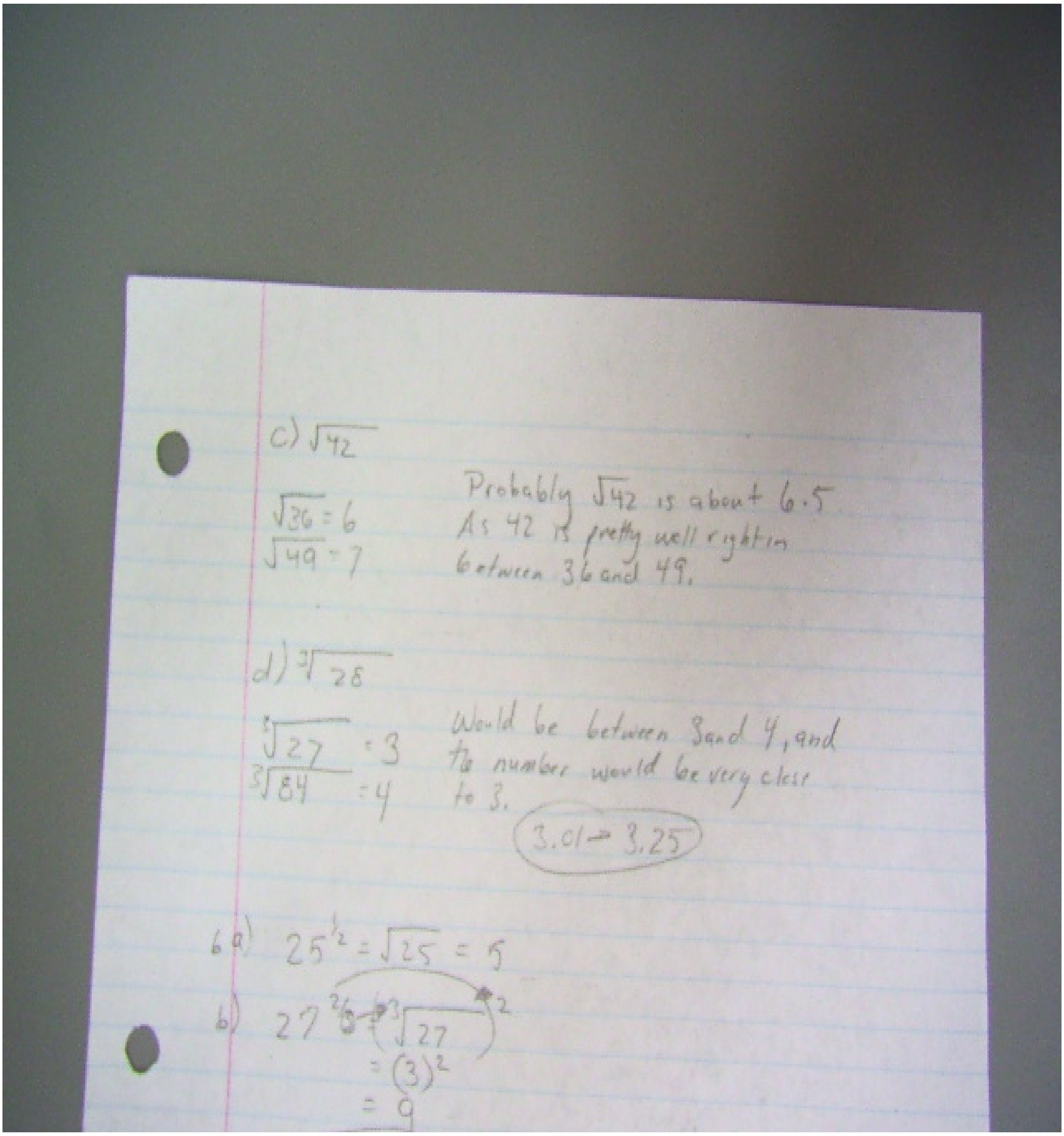
6) $\sqrt[3]{11}$

$\sqrt[3]{8}=2$

$\sqrt[3]{27}=3$

Answer will be between 2 and 3. ~~Th~~ The decimal will below.

$\boxed{2 \text{ to } 2.5}$



c) $\sqrt{42}$

$\sqrt{36}=6$
$\sqrt{49}=7$

Probably $\sqrt{42}$ is about 6.5 As 42 is pretty well right in between 36 and 49.

d) $\sqrt[3]{28}$

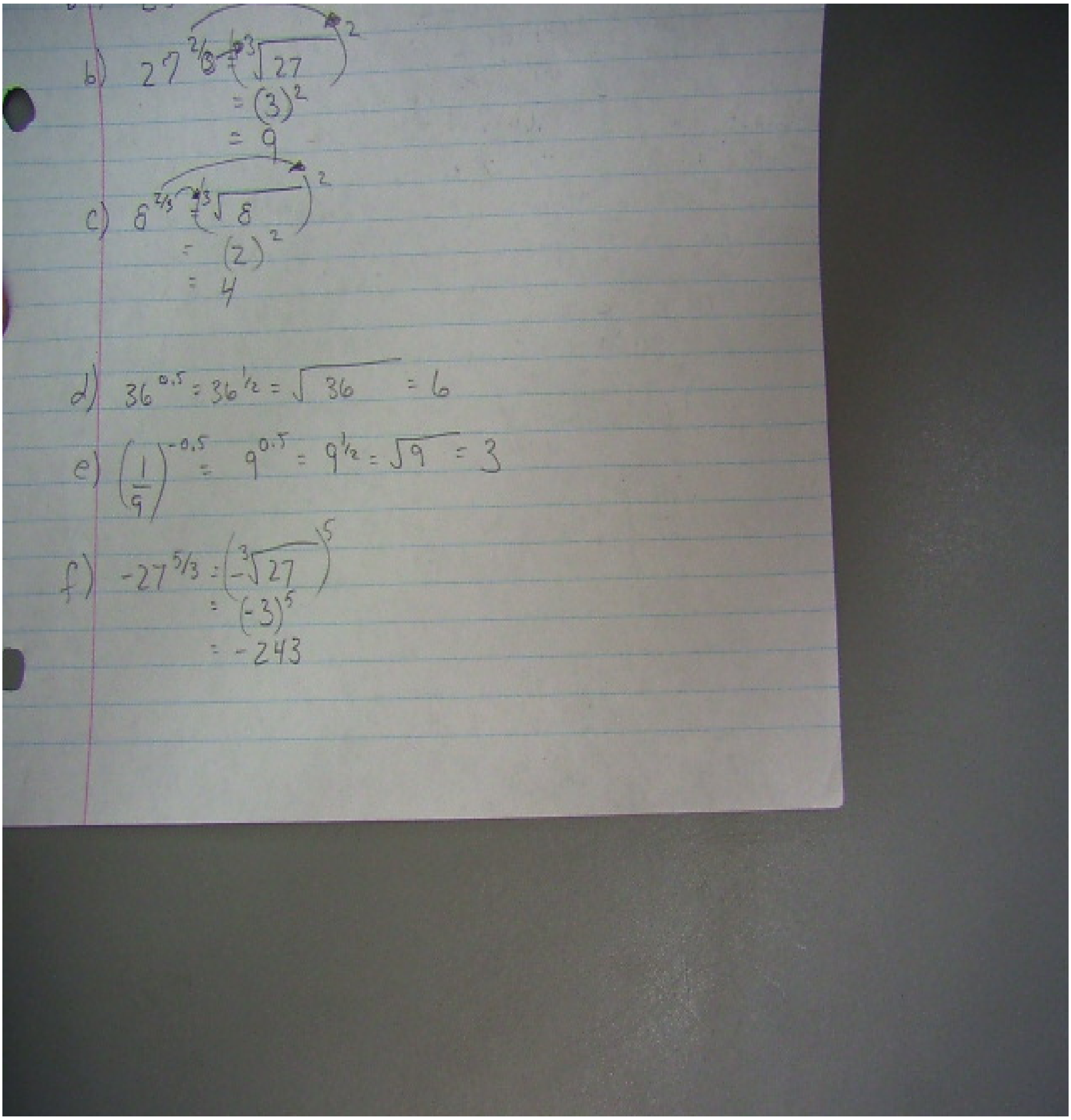
$\sqrt[3]{27}=3$
$\sqrt[3]{84}=4$

Would be between 3 and 4, and the number would be very close to 3.

$\boxed{3.01 \rightarrow 3.25}$

6a) $25^{\frac{1}{2}}=\sqrt{25}=5$

b) $27^{2/3} = \left(\sqrt[3]{27}\right)^2$
$= (3)^2$
$= 9$



b) $27^{2/3} = \left(\sqrt[3]{27}\right)^2$

$= (3)^2$

$= 9$

c) $8^{2/3} = \left(\sqrt[3]{8}\right)^2$

$= (2)^2$

$= 4$

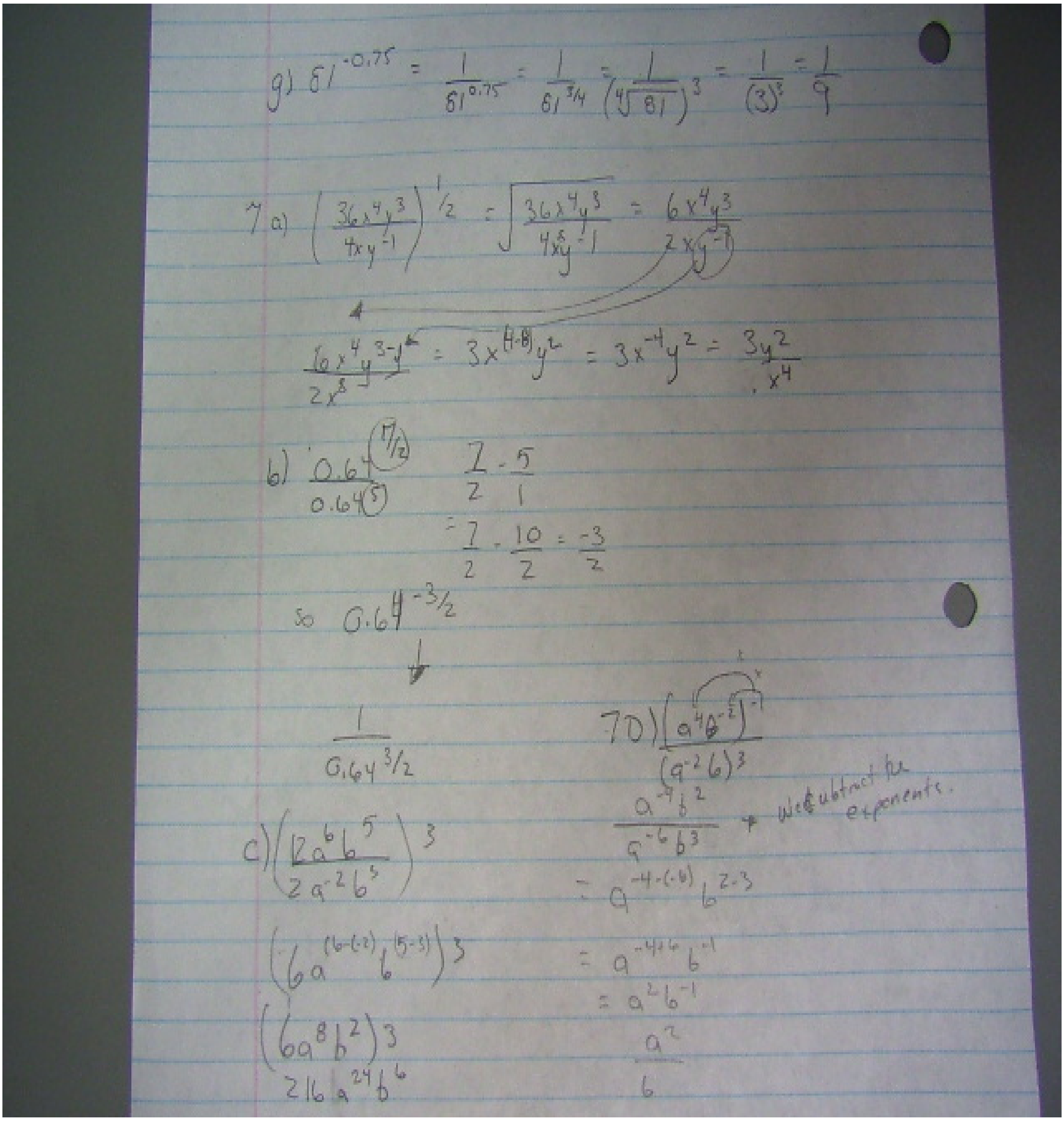
d) $36^{0.5} = 36^{1/2} = \sqrt{36} = 6$

e) $\left(\frac{1}{9}\right)^{-0.5} = 9^{0.5} = 9^{1/2} = \sqrt{9} = 3$

f) $-27^{5/3} = \left(-\sqrt[3]{27}\right)^5$

$= (-3)^5$

$= -243$



g) $81^{-0.75} = \frac{1}{81^{0.75}} = \frac{1}{81^{3/4}} = \frac{1}{(\sqrt[4]{81})^3} = \frac{1}{(3)^3} = \frac{1}{9}$

7 a) $\left(\frac{36x^4y^3}{4xy^{-1}}\right)^{1/2} = \sqrt{\frac{36x^4y^3}{4x^8y^{-1}}} = \frac{6x^4y^3}{2xy^{-1}}$

$\frac{6x^4y^{3-y}}{2x^8} = 3x^{(4-8)}y^2 = 3x^{-4}y^2 = \frac{3y^2}{x^4}$

b) $\frac{0.64^{7/2}}{0.64^{5}}$ $\frac{7}{2} - \frac{5}{1}$

$= \frac{7}{2} - \frac{10}{2} = \frac{-3}{2}$

so $0.64^{-3/2}$

$\downarrow$

$\frac{1}{0.64^{3/2}}$

c) $\left(\frac{12a^6b^5}{2a^{-2}b^3}\right)^3$

$\left(6a^{(6-(-2))}b^{(5-3)}\right)^3$

$\left(6a^8b^2\right)^3$

$216a^{24}b^6$

7D) $\frac{(a^4b^{-2})^{-1}}{(a^{-2}b)^3}$

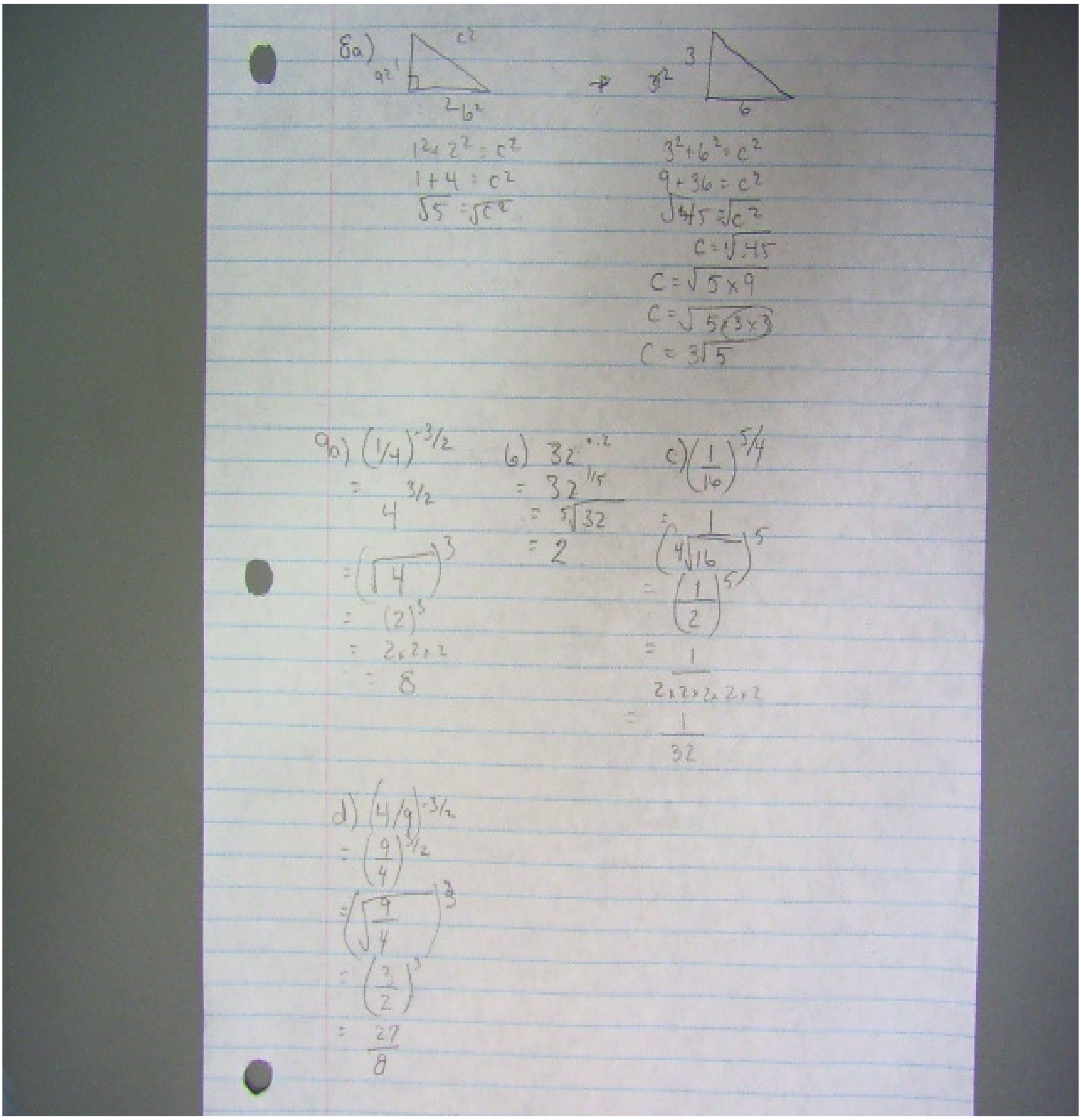
$\frac{a^{-4}b^2}{a^{-6}b^3}$ * We subtract the exponents.

$= a^{-4-(-6)}b^{2-3}$

$= a^{-4+6}b^{-1}$

$= a^2b^{-1}$

$\frac{a^2}{b}$



8a)

$1^2+2^2=c^2$

$1+4=c^2$

$\sqrt{5}=\sqrt{c^2}$

$3^2+6^2=c^2$

$9+36=c^2$

$\sqrt{45}=\sqrt{c^2}$

$c=\sqrt{45}$

$C=\sqrt{5\times9}$

$C=\sqrt{5\boxed{3\times3}}$

$C=3\sqrt{5}$

9a) $(1/4)^{-3/2}$

$=4^{3/2}$

$=(\sqrt{4})^3$

$=(2)^3$

$=2\times2\times2$

$=8$

b) $32^{.2}$

$=32^{1/5}$

$=\sqrt[5]{32}$

$=2$

c) $\left(\frac{1}{16}\right)^{5/4}$

$=\left(\frac{1}{\sqrt[4]{16}}\right)^5$

$=\left(\frac{1}{2}\right)^5$

$=\frac{1}{2\times2\times2\times2\times2}$

$=\frac{1}{32}$

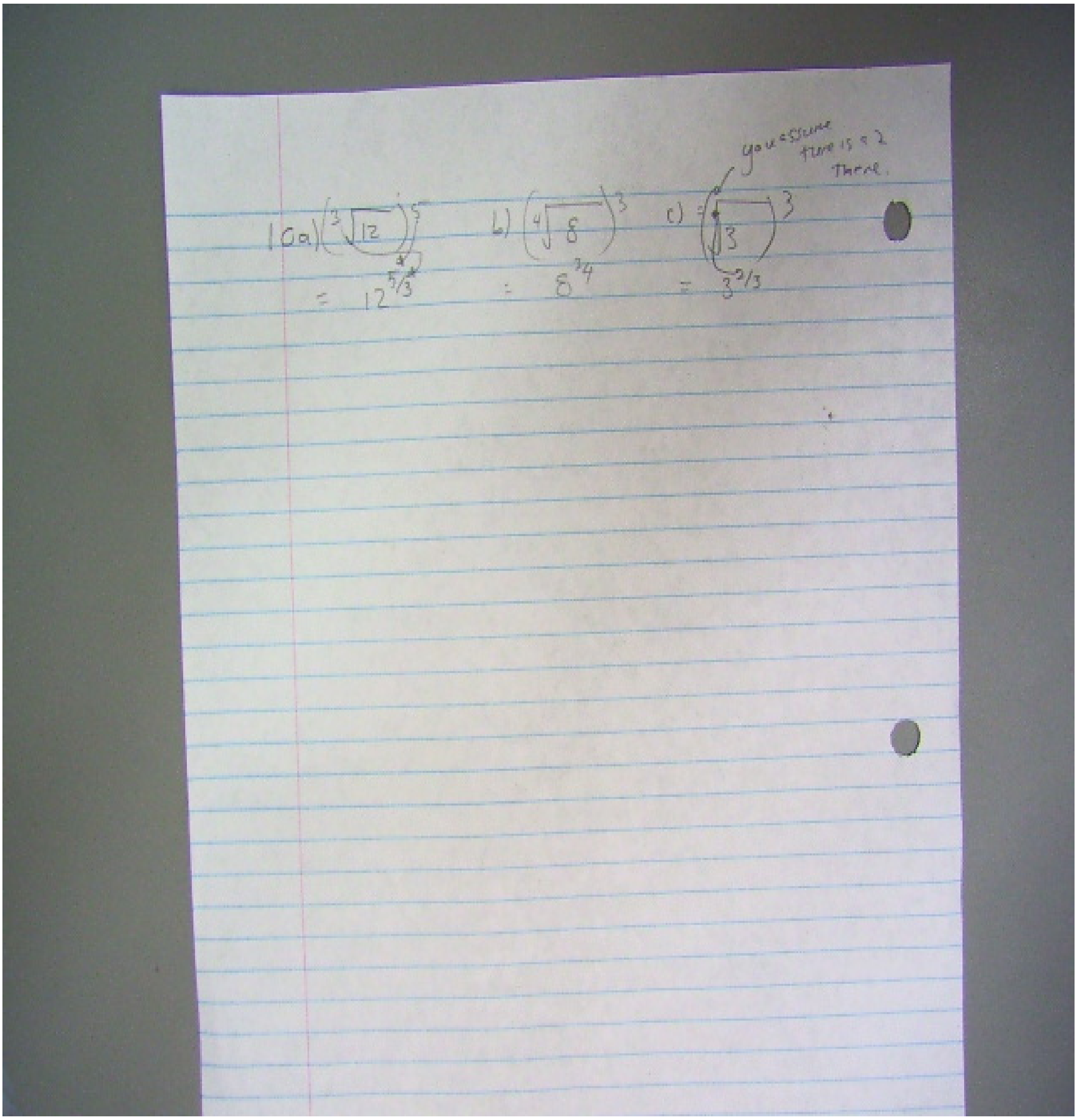
d) $(4/9)^{-3/2}$

$=\left(\frac{9}{4}\right)^{3/2}$

$=\left(\sqrt{\frac{9}{4}}\right)^3$

$=\left(\frac{3}{2}\right)^3$

$=\frac{27}{8}$

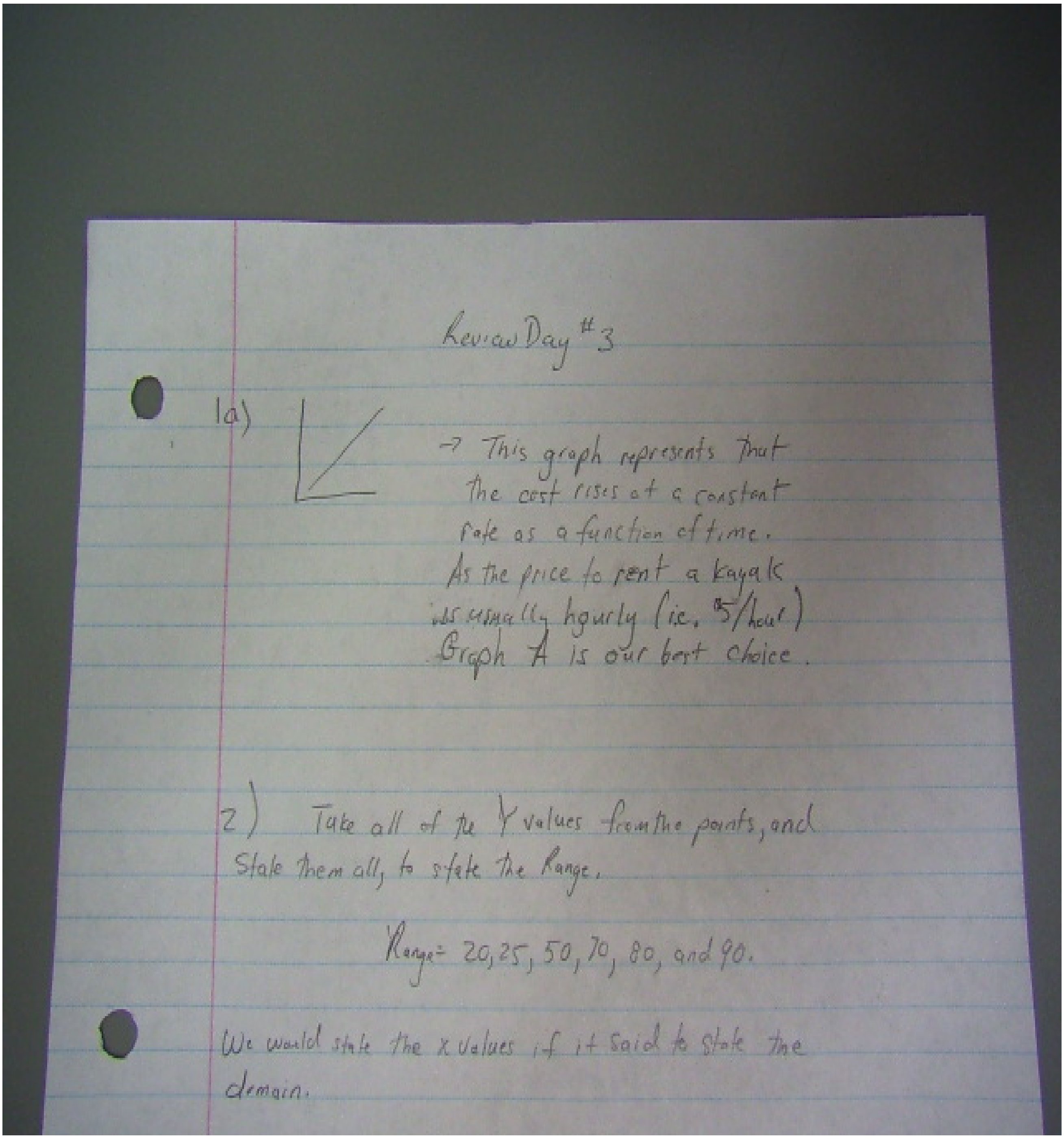


you assume there is a 2 there.

10a) $\left(\sqrt[3]{12}\right)^5$ $= 12^{5/3}$

b) $\left(\sqrt[4]{8}\right)^3$ $= 8^{3/4}$

c) $\left(\sqrt{3}\right)^3$ $= 3^{3/2}$



Review Day #3

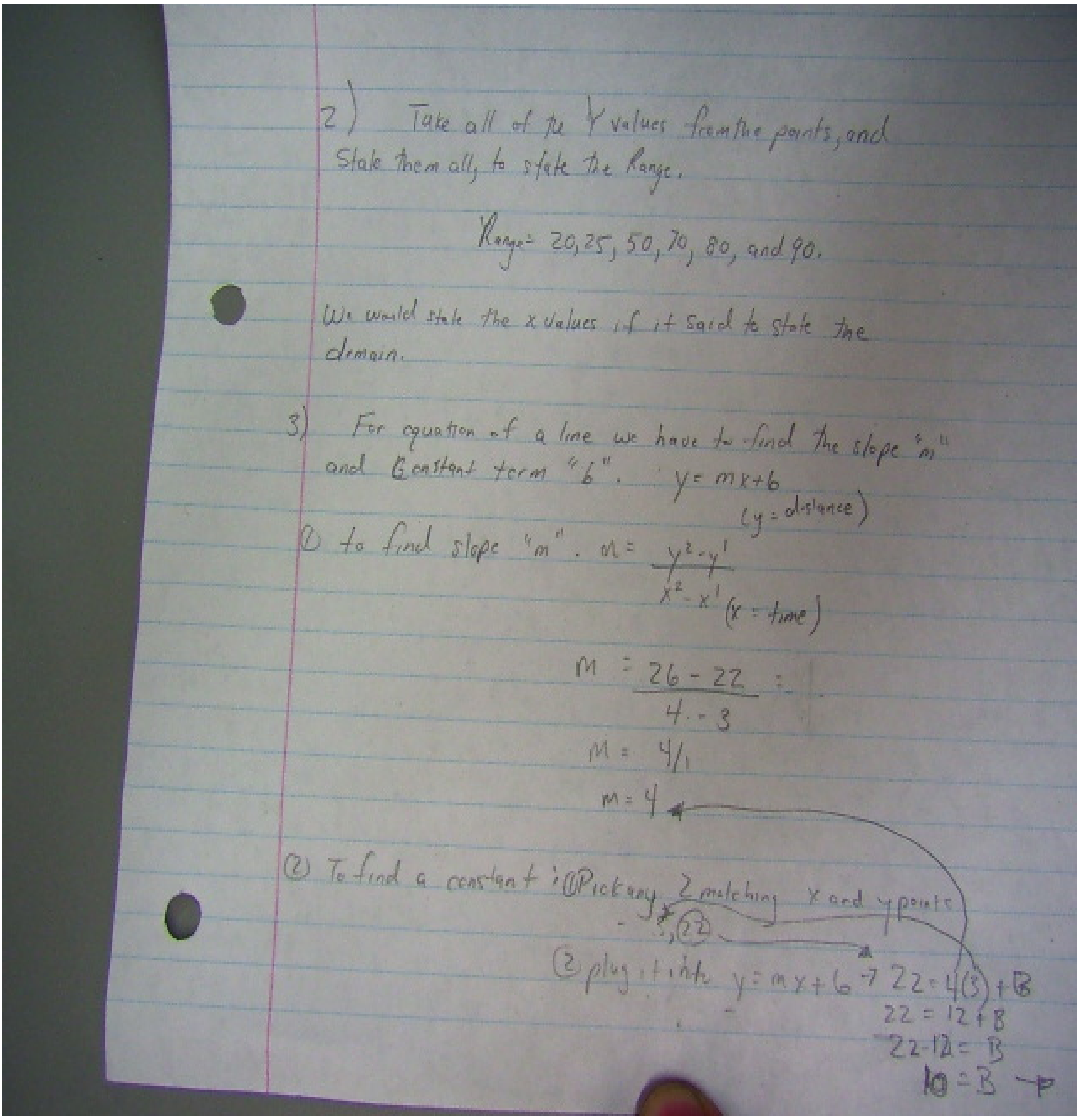
1a)

→ This graph represents that the cost rises at a constant rate as a function of time. As the price to rent a kayak is usually hourly (ie. \$5/hour) Graph A is our best choice.

2) Take all of the Y values from the points, and State them all, to state the Range.

Range = 20, 25, 50, 70, 80, and 90.

We would state the x values if it said to state the domain.



2) Take all of the Y values from the points, and State them all, to state the Range.

Range = 20, 25, 50, 70, 80, and 90.

We would state the x values if it said to state the domain.

3) For equation of a line we have to find the slope "m" and Constant term "b". $y = mx + b$

(y = distance)

① to find slope "m". $m = \frac{y^2 - y^1}{x^2 - x^1}$ (x = time)

$$m = \frac{26 - 22}{4 - 3}$$

$$m = 4/1$$

$$m = 4$$

② To find a constant: ① Pick any 2 matching x and y points

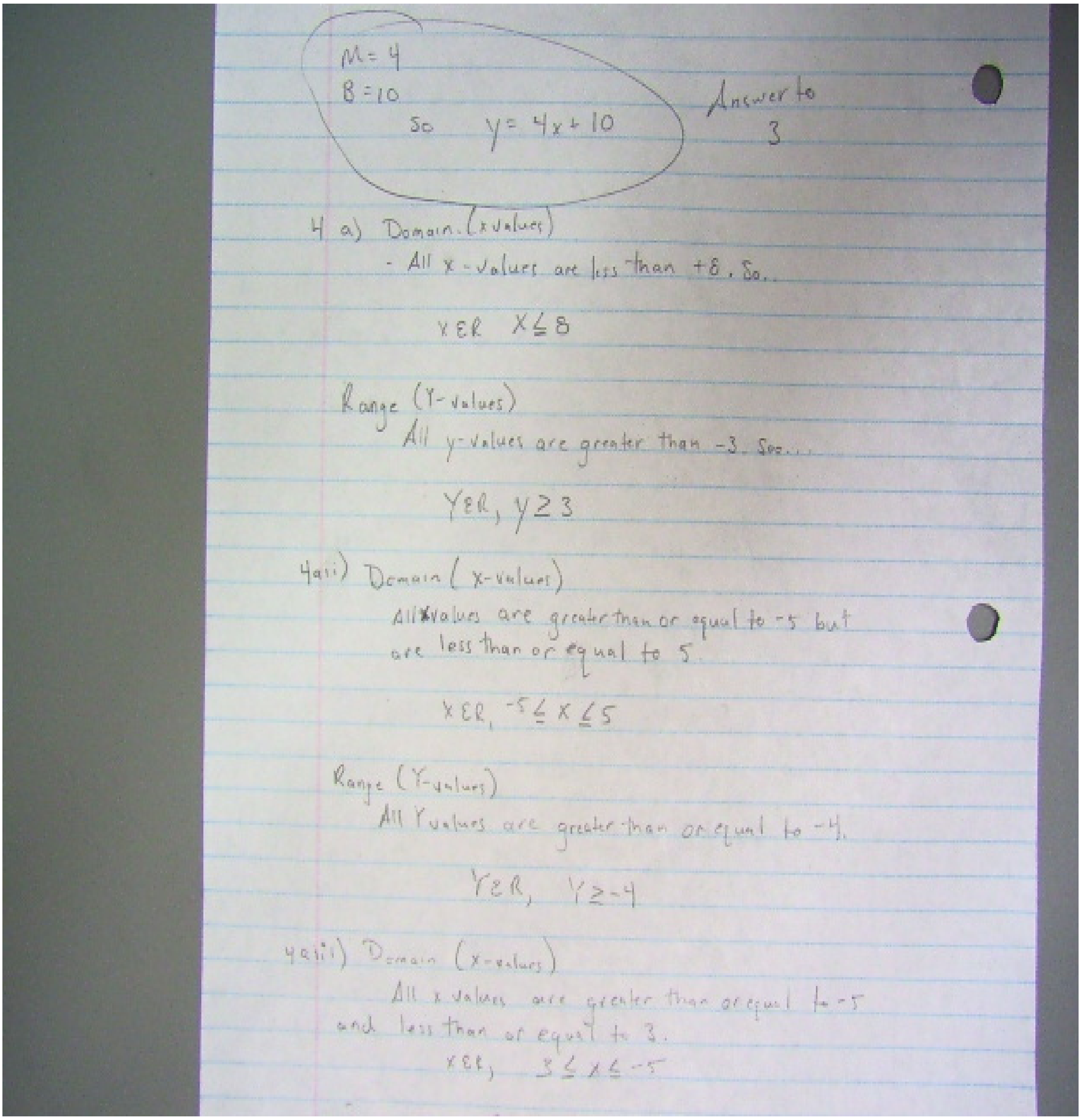
3, ㉒

② plug it into $y = mx + b \rightarrow 22 = 4(3) + B$

$$22 = 12 + B$$

$$22 - 12 = B$$

$$10 = B \rightarrow$$



$M = 4$

$B = 10$

So $y = 4x + 10$

Answer to 3

4 a) Domain. (x values)

- All x-values are less than +8. So..

$x \in R \quad X \leq 8$

Range (Y-values)

All y-values are greater than -3. Soo...

$Y \in R, y \geq 3$

4aii) Domain (x-values)

All x values are greater than or equal to -5 but are less than or equal to 5.

$x \in R, -5 \leq x \leq 5$

Range (Y-values)

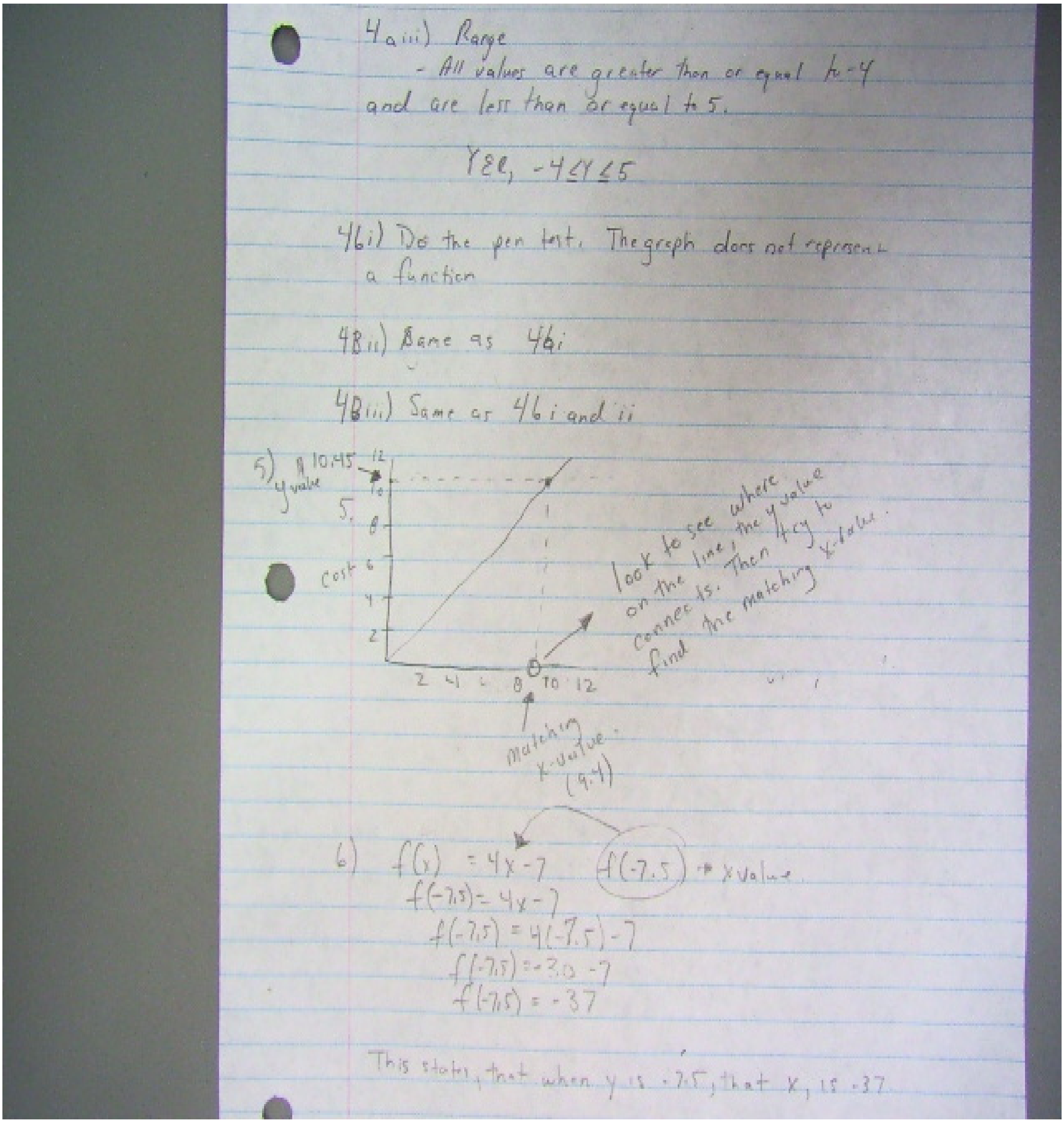
All Y values are greater than or equal to -4.

$Y \in R, \ Y \geq -4$

4aiii) Domain (x-values)

All x values are greater than or equal to -5 and less than or equal to 3.

$x \in R, \ 3 \leq x \leq -5$



4aiii) Range

- All values are greater than or equal to -4 and are less than or equal to 5.

$Y \in \mathbb{R}, -4 \leq Y \leq 5$

4bi) Do the pen test. The graph does not represent a function

4Bii) Same as 4bi

4Biii) Same as 4bi and ii

5)

6) $f(x) = 4x - 7$ $\quad f(-7.5) \rightarrow$ x value

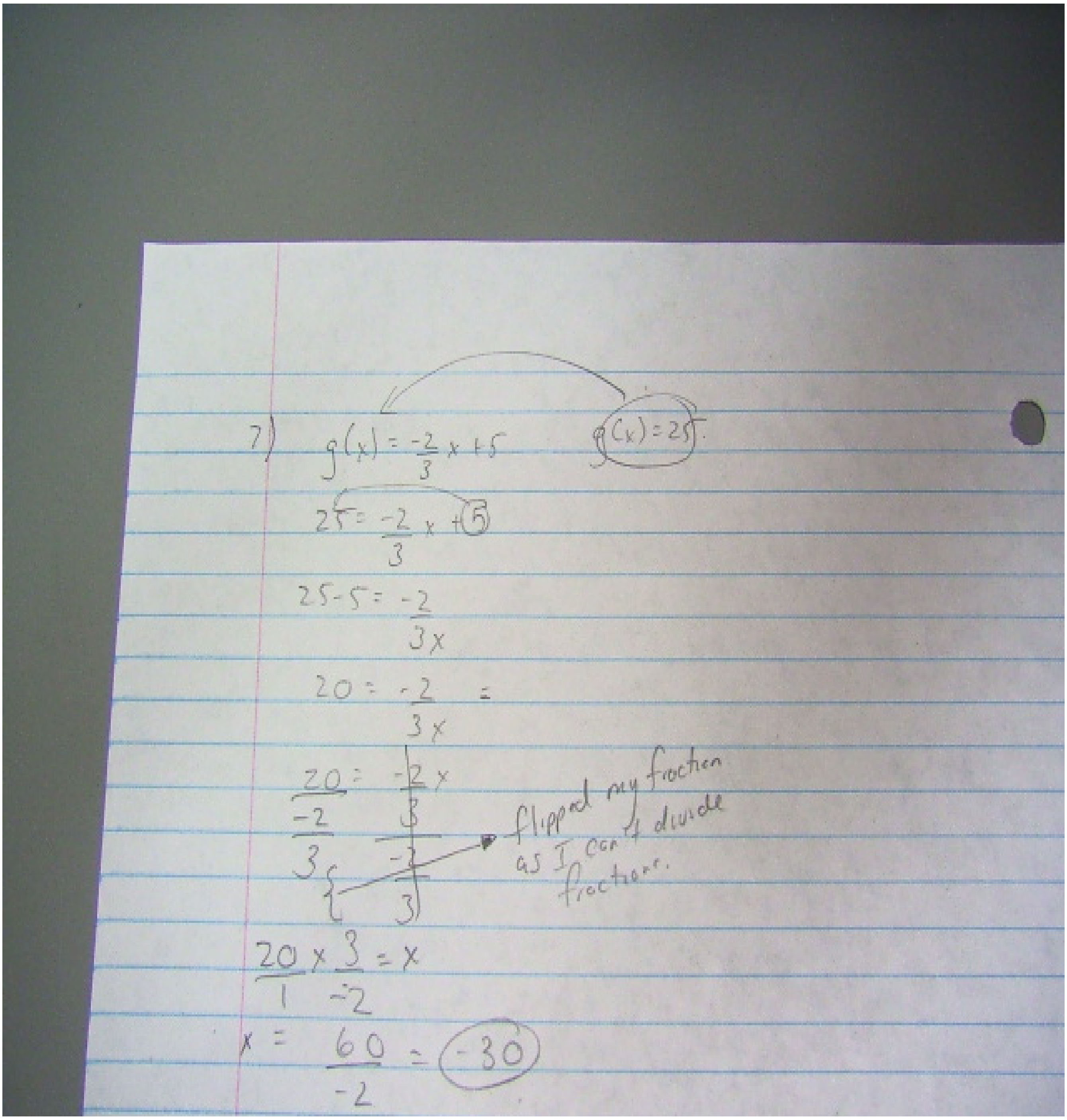
$f(-7.5) = 4x - 7$

$f(-7.5) = 4(-7.5) - 7$

$f(-7.5) = -30 - 7$

$f(-7.5) = -37$

This states, that when y is -7.5, that x, is -37



7) $g(x) = \frac{-2}{3}x + 5$ $\boxed{g(x) = 25}$

$25 = \frac{-2}{3}x + \boxed{5}$

$25 - 5 = \frac{-2}{3x}$

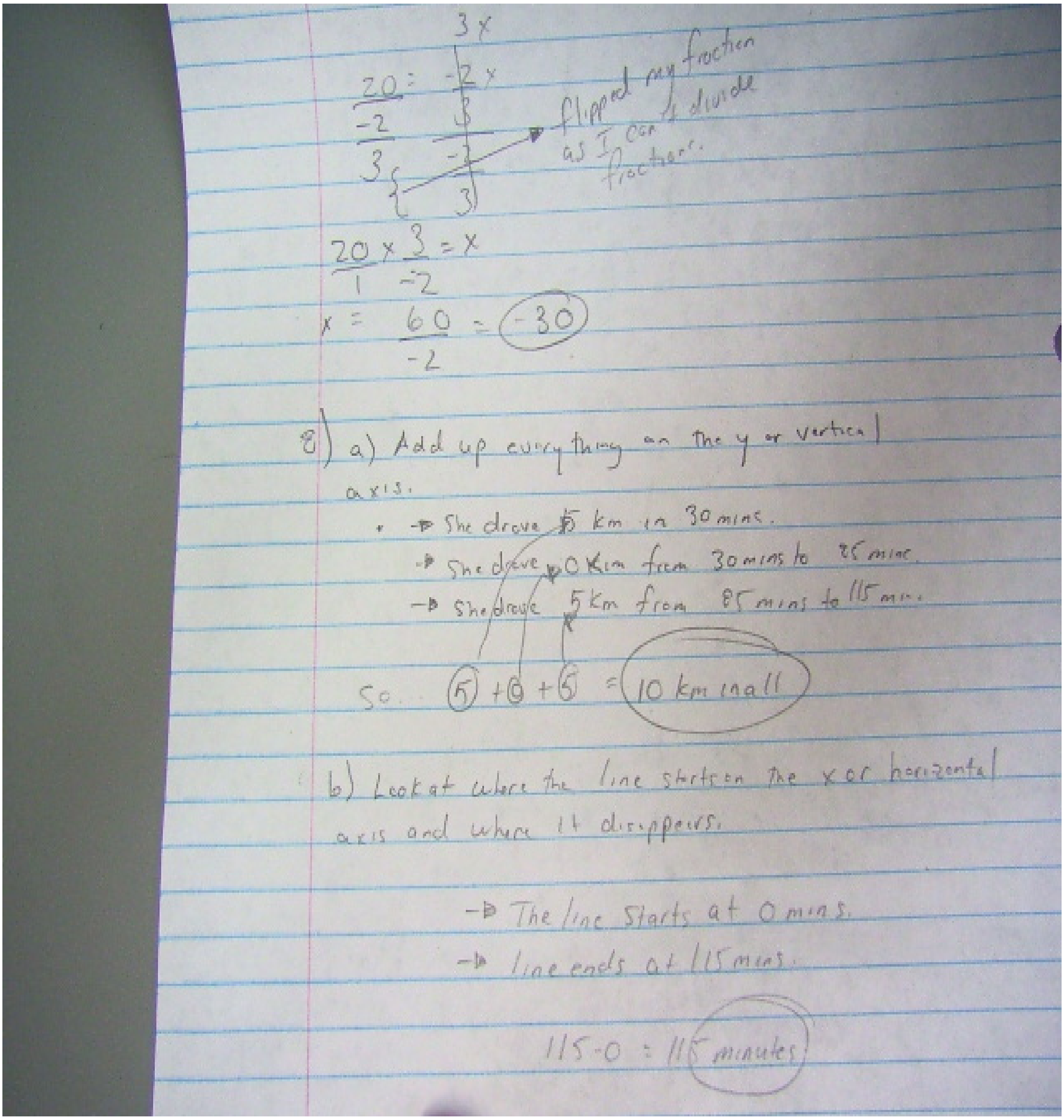
$20 = \frac{-2}{3x} =$

$$\frac{20}{\frac{-2}{3}} = \frac{\cancel{\frac{-2}{3}}x}{\cancel{\frac{-2}{3}}}$$

flipped my fraction as I can't divide fractions.

$\frac{20}{1} \times \frac{3}{-2} = x$

$x = \frac{60}{-2} = \boxed{-30}$



$$\frac{20}{\frac{-2}{3}} = \frac{\frac{\cancel{-2}}{\cancel{3}}x}{\frac{-2}{3}}$$

flipped my fraction as I can't divide fractions.

$$\frac{20}{1} \times \frac{3}{-2} = x$$

$$x = \frac{60}{-2} = \boxed{-30}$$

8) a) Add up everything on the y or vertical axis.

- → She drove 5 km in 30 mins.
- → She drove 0 km from 30 mins to 85 mins.
- → She drove 5 km from 85 mins to 115 min.

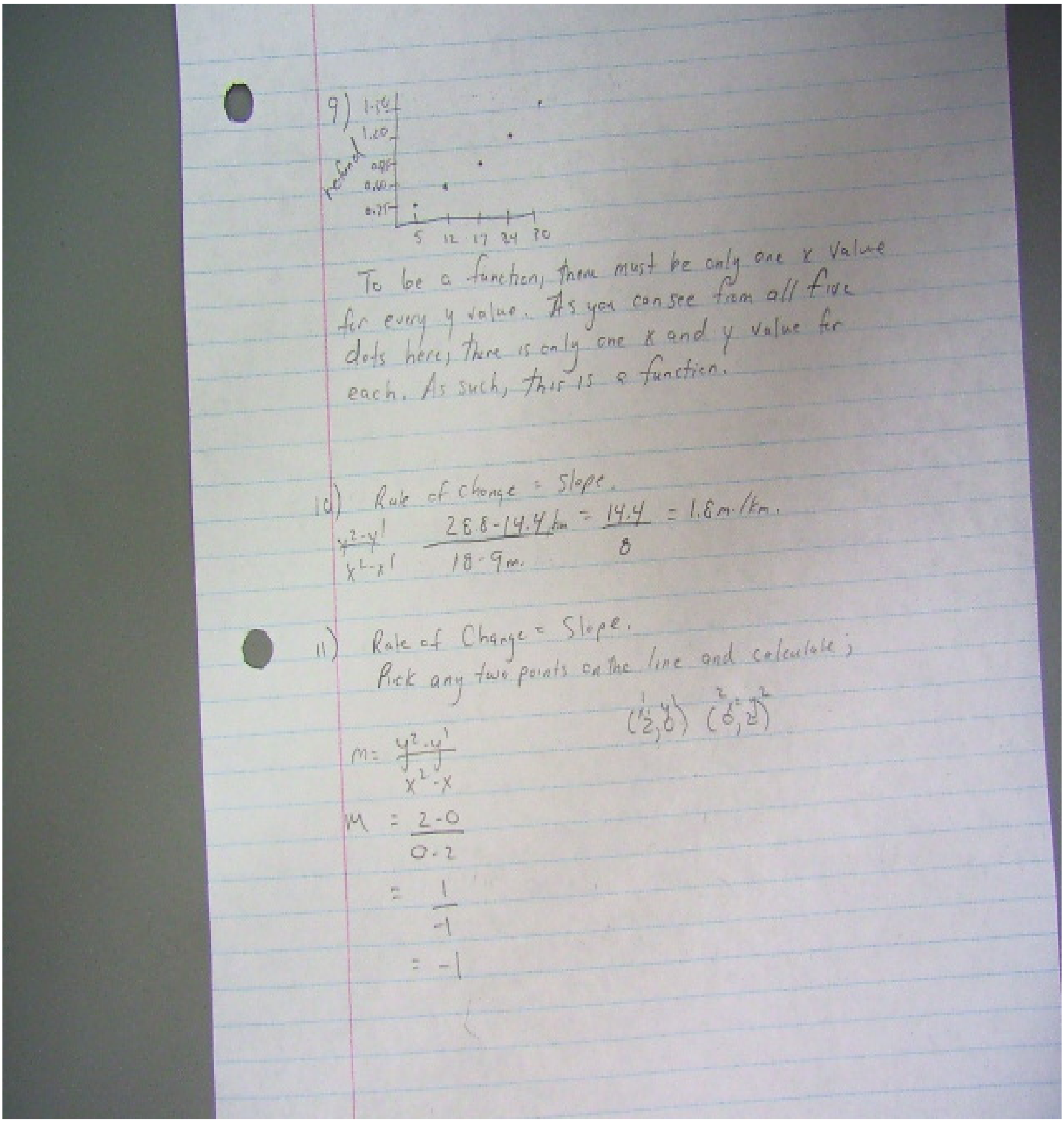
So. ⑤ + ⓪ + ⑤ = $\boxed{\text{10 km in all}}$

b) Look at where the line starts on the x or horizontal axis and where it disappears.

→ The line starts at 0 mins.

→ line ends at 115 mins.

115 - 0 = $\boxed{\text{115 minutes}}$



9)

To be a function, there must be only one x value for every y value. As you can see from all five dots here, there is only one x and y value for each. As such, this is a function.

10) Rate of Change = Slope.

$\frac{y^2-y^1}{x^2-x^1}$ $\frac{28.8-14.4\,km}{18-9m.} = \frac{14.4}{8} = 1.8m./km.$

11) Rate of Change = Slope.
Pick any two points on the line and calculate;

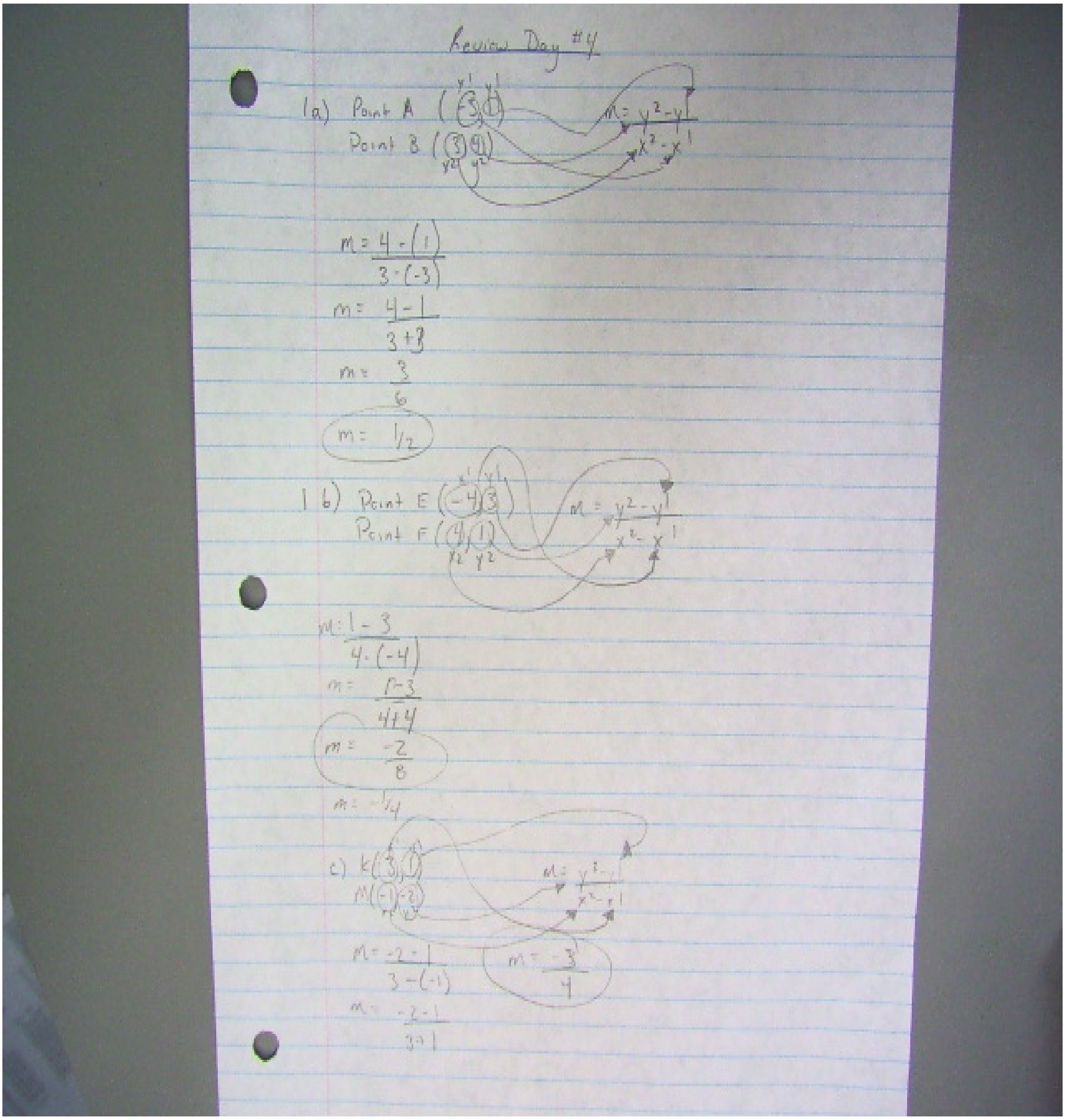
$(\overset{1}{2},\overset{y}{0})$ $(\overset{2}{0},\overset{y^2}{2})$

$m = \frac{y^2-y^1}{x^2-x}$

$M = \frac{2-0}{0-2}$

$= \frac{1}{-1}$

$= -1$



Review Day #4

1a) Point A $(\overset{x^1}{-3}, \overset{y^1}{1})$ $m = \frac{y^2 - y^1}{x^2 - x^1}$

Point B $(\underset{x^2}{3}, \underset{y^2}{4})$

$m = \frac{4 - (1)}{3 - (-3)}$

$m = \frac{4 - 1}{3 + 3}$

$m = \frac{3}{6}$

$\boxed{m = 1/2}$

1 b) Point E $(\overset{x^1}{-4}, \overset{y^1}{3})$ $m = \frac{y^2 - y^1}{x^2 - x^1}$

Point F $(\underset{x^2}{4}, \underset{y^2}{1})$

$m = \frac{1 - 3}{4 - (-4)}$

$m = \frac{1 - 3}{4 + 4}$

$\boxed{m = \frac{-2}{8}}$

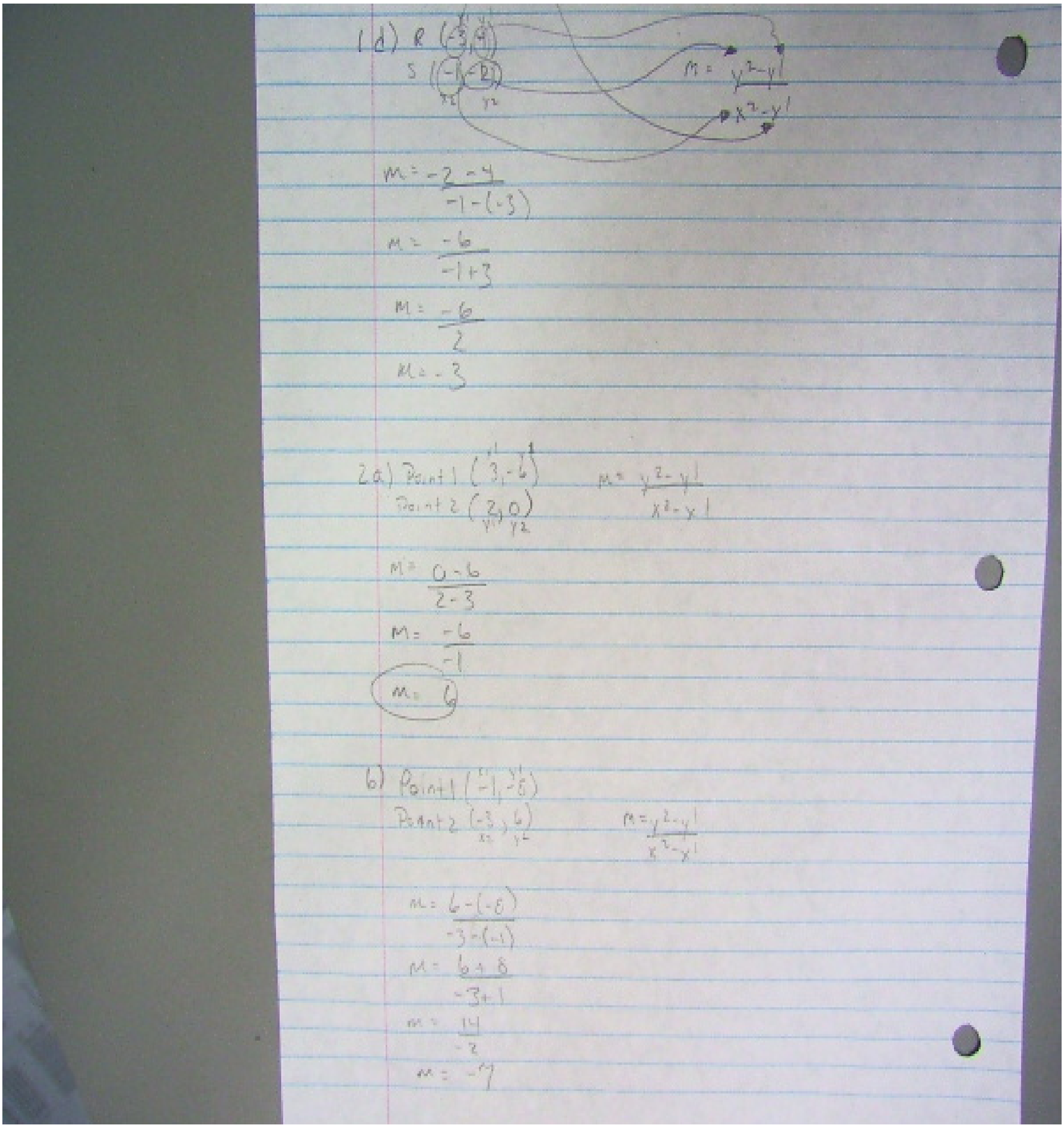
$m = -1/4$

c) K$(3, 1)$ $m = \frac{y^2 - y^1}{x^2 - x^1}$

M$(-1, -2)$

$m = \frac{-2 - 1}{3 - (-1)}$ $\boxed{m = \frac{-3}{4}}$

$m = \frac{-2 - 1}{3 + 1}$



1d) R $(\overset{x1}{-3}, \overset{y1}{4})$

S $(\underset{x2}{-1}, \underset{y2}{-2})$

$m = \frac{y^2-y^1}{x^2-y^1}$

$m = \frac{-2-4}{-1-(-3)}$

$m = \frac{-6}{-1+3}$

$m = \frac{-6}{2}$

$m = -3$

2a) Point 1 $(\overset{1}{3}, \overset{1}{-6})$

Point 2 $(\underset{y1}{2}, \underset{y2}{0})$

$m = \frac{y^2-y^1}{x^2-y^1}$

$m = \frac{0-6}{2-3}$

$m = \frac{-6}{-1}$

$\boxed{m = 6}$

b) Point 1 $(\overset{x1}{-1}, \overset{y1}{-8})$

Point 2 $(\underset{x2}{-3}, \underset{y2}{6})$

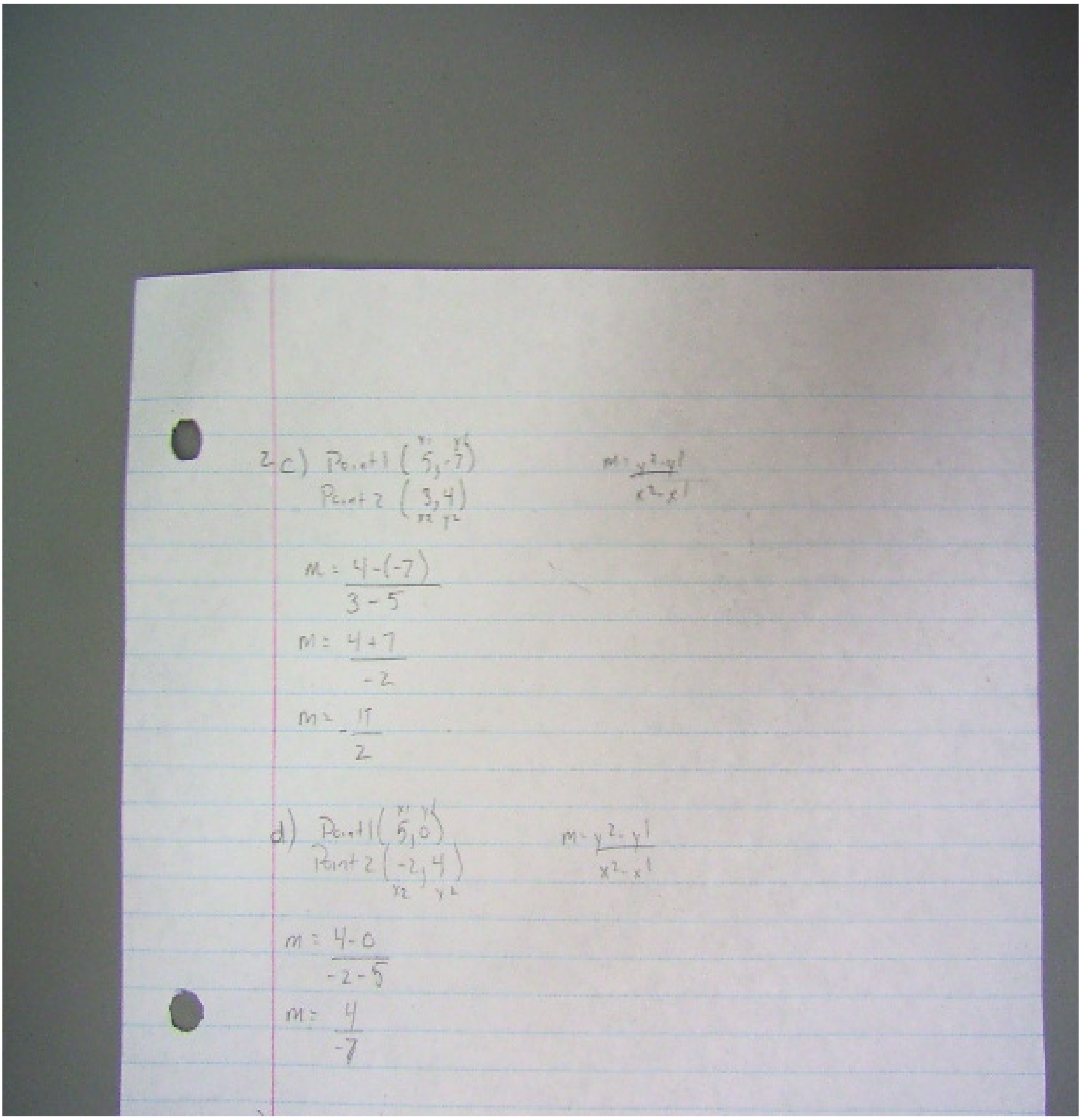
$m = \frac{y^2-y^1}{x^2-y^1}$

$m = \frac{6-(-8)}{-3-(-1)}$

$m = \frac{6+8}{-3+1}$

$m = \frac{14}{-2}$

$m = -7$



2 c) Point 1 $(\overset{x1}{5}, \overset{y1}{-7})$

Point 2 $(\underset{x2}{3}, \underset{y2}{4})$

$m = \frac{y2 - y1}{x2 - x1}$

$m = \frac{4-(-7)}{3-5}$

$m = \frac{4+7}{-2}$

$m = -\frac{11}{2}$

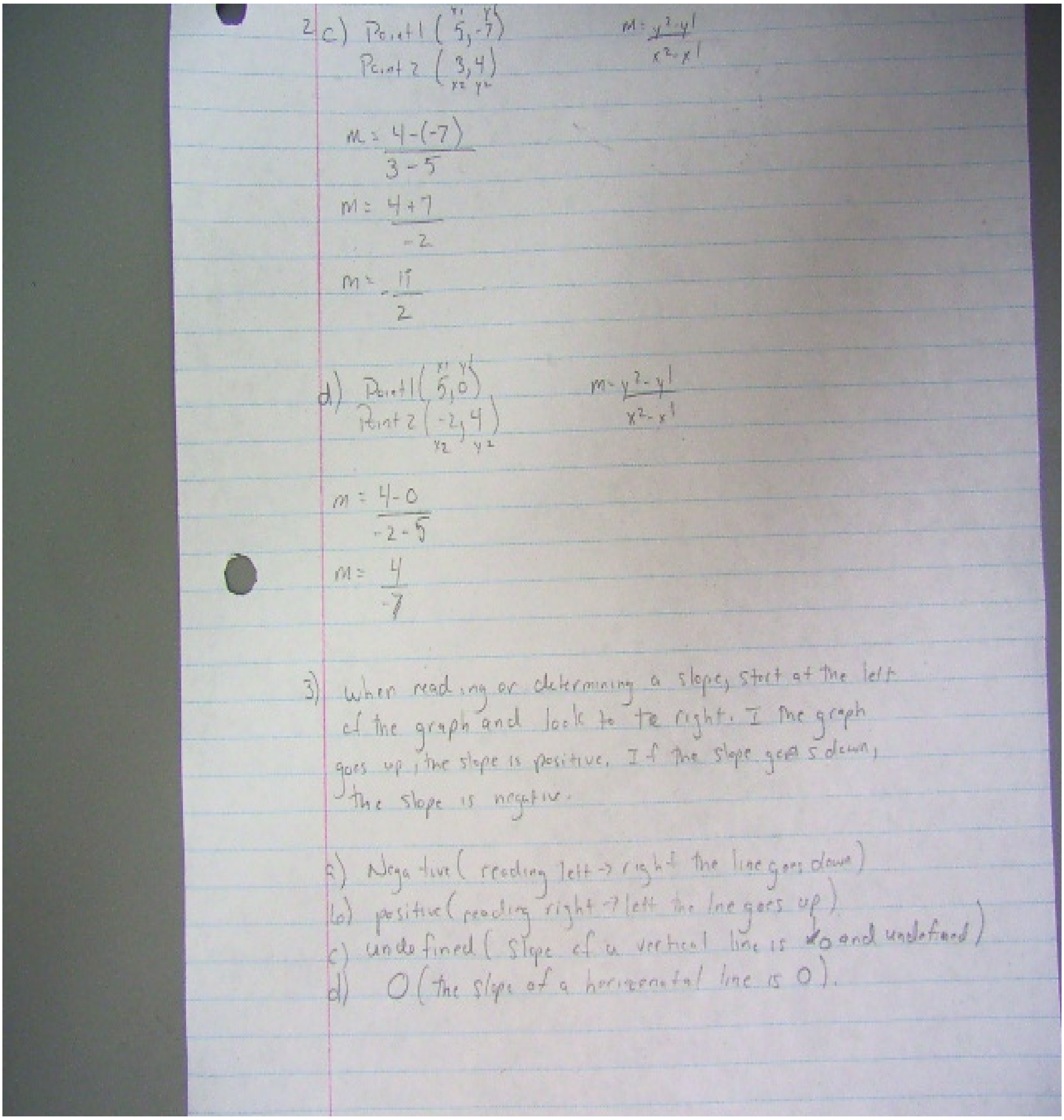
d) Point 1 $(\overset{x1}{5}, \overset{y1}{0})$

Point 2 $(\underset{x2}{-2}, \underset{y2}{4})$

$m = \frac{y2 - y1}{x2 - x1}$

$m = \frac{4-0}{-2-5}$

$m = \frac{4}{-7}$



2 c) Point 1 $(\overset{x1}{5}, \overset{y1}{-7})$ $m = \frac{y2-y1}{x2-x1}$

Point 2 $(\underset{x2}{3}, \underset{y2}{4})$

$m = \frac{4-(-7)}{3-5}$

$m = \frac{4+7}{-2}$

$m = -\frac{11}{2}$

d) Point 1 $(\overset{x1}{5}, \overset{y1}{0})$ $m = \frac{y2-y1}{x2-x1}$

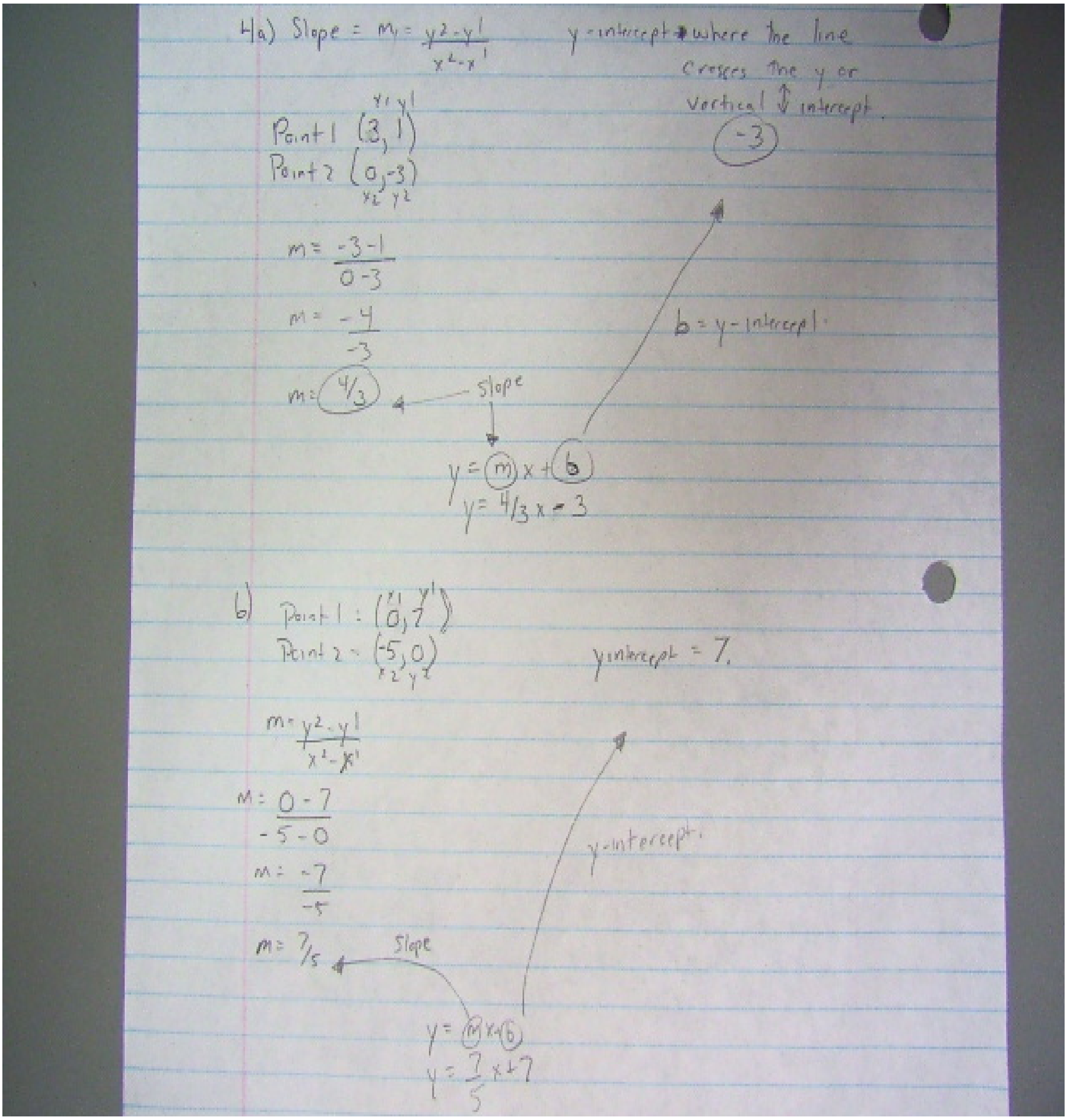
Point 2 $(\underset{x2}{-2}, \underset{y2}{4})$

$m = \frac{4-0}{-2-5}$

$m = \frac{4}{-7}$

3) When reading or determining a slope, stert at the left of the graph and look to te right. I the graph goes up, the slope is positive. If the slope goes down, the slope is negativ.

a) Negative (reading left -> right the line goes down)
b) positive (reading right -> left the line goes up)
c) undefined (slope of a vertical line is 0 and undefined)
d) 0 (the slope of a horizontal line is 0).



4a) Slope $= m_1 = \frac{y2-y1}{x2-x1}$

y-intercept = where the line crosses the y or vertical ⇕ intercept.

$\boxed{-3}$

Point 1 $(\overset{x1}{3}, \overset{y1}{1})$

Point 2 $(\underset{x2}{0}, \underset{y2}{-3})$

$m = \frac{-3-1}{0-3}$

$m = \frac{-4}{-3}$

$m = \boxed{4/3}$

slope

b = y-intercept.

$y = \boxed{m}x + \boxed{b}$

$y = 4/3x - 3$

b) Point 1 : $(\overset{x1}{0}, \overset{y1}{7})$

Point 2 = $(\underset{x2}{-5}, \underset{y2}{0})$

yintercept = 7.

$m = \frac{y2-y1}{x2-x1}$

$m = \frac{0-7}{-5-0}$

$m = \frac{-7}{-5}$

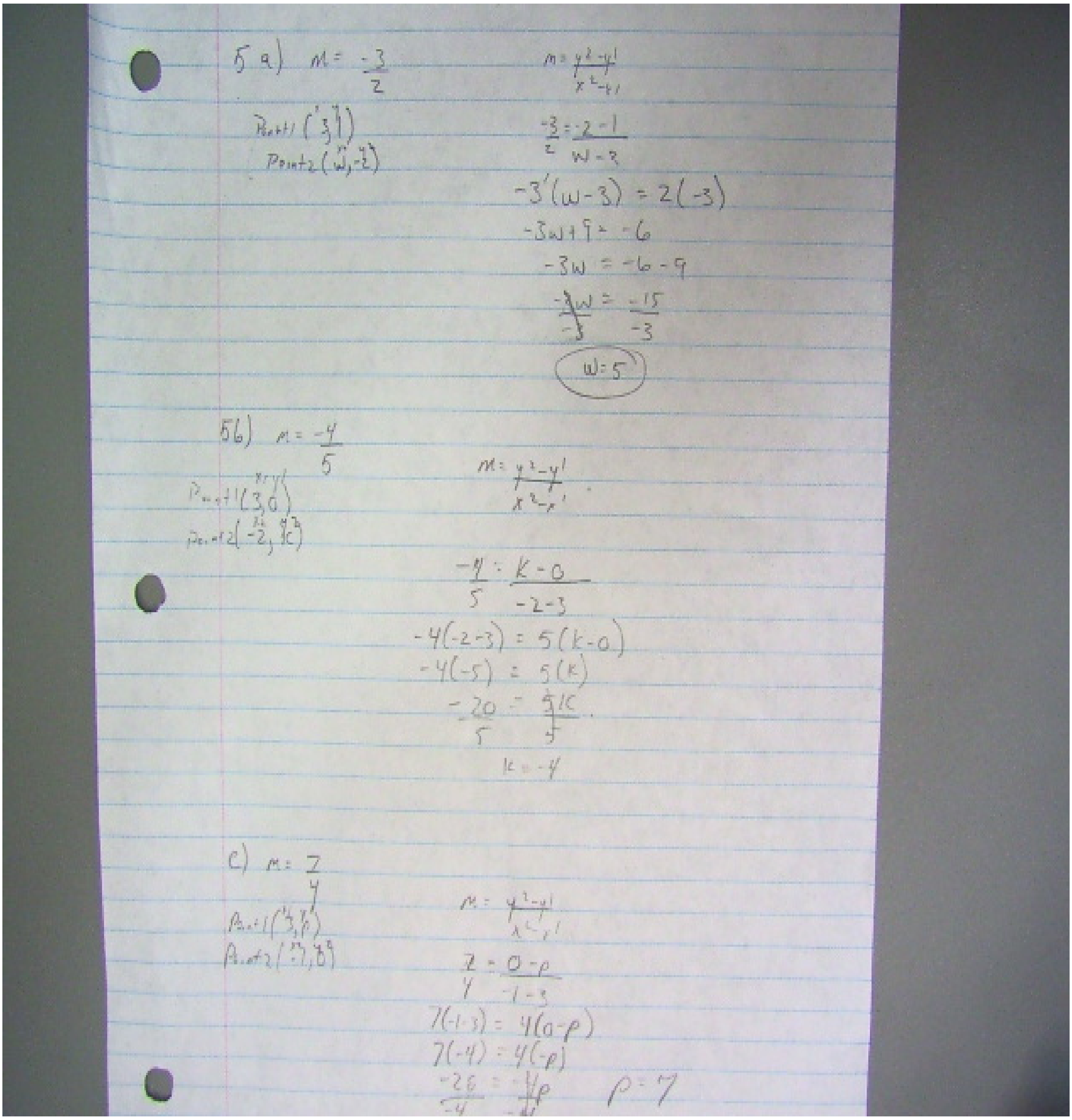
$m = 7/5$

Slope

y-intercept.

$y = \boxed{m}x + \boxed{b}$

$y = \frac{7}{5}x + 7$



5 a) $m = \frac{-3}{2}$

$m = \frac{y2 - y1}{x2 - y1}$

Point1 $(\overset{x1}{3}, \overset{y1}{1})$

Point2 $(\overset{x2}{w}, \overset{y2}{-2})$

$\frac{-3}{2} = \frac{-2-1}{w-3}$

$-3(w-3) = 2(-3)$

$-3w+9 = -6$

$-3w = -6-9$

$\frac{\cancel{-3}w}{\cancel{-3}} = \frac{-15}{-3}$

$\boxed{w=5}$

5b) $m = \frac{-4}{5}$

$m = \frac{y2-y1}{x2-x1}$

Point1 $(\overset{x1}{3}, \overset{y1}{0})$

Point2 $(\overset{x2}{-2}, \overset{y2}{k})$

$\frac{-4}{5} = \frac{k-0}{-2-3}$

$-4(-2-3) = 5(k-0)$

$-4(-5) = 5(k)$

$\frac{-20}{5} = \frac{\cancel{5}k}{\cancel{5}}$

$k = -4$

c) $m = \frac{7}{4}$

$m = \frac{y2-y1}{x2-x1}$

Point1 $(\overset{x1}{3}, \overset{y1}{p})$

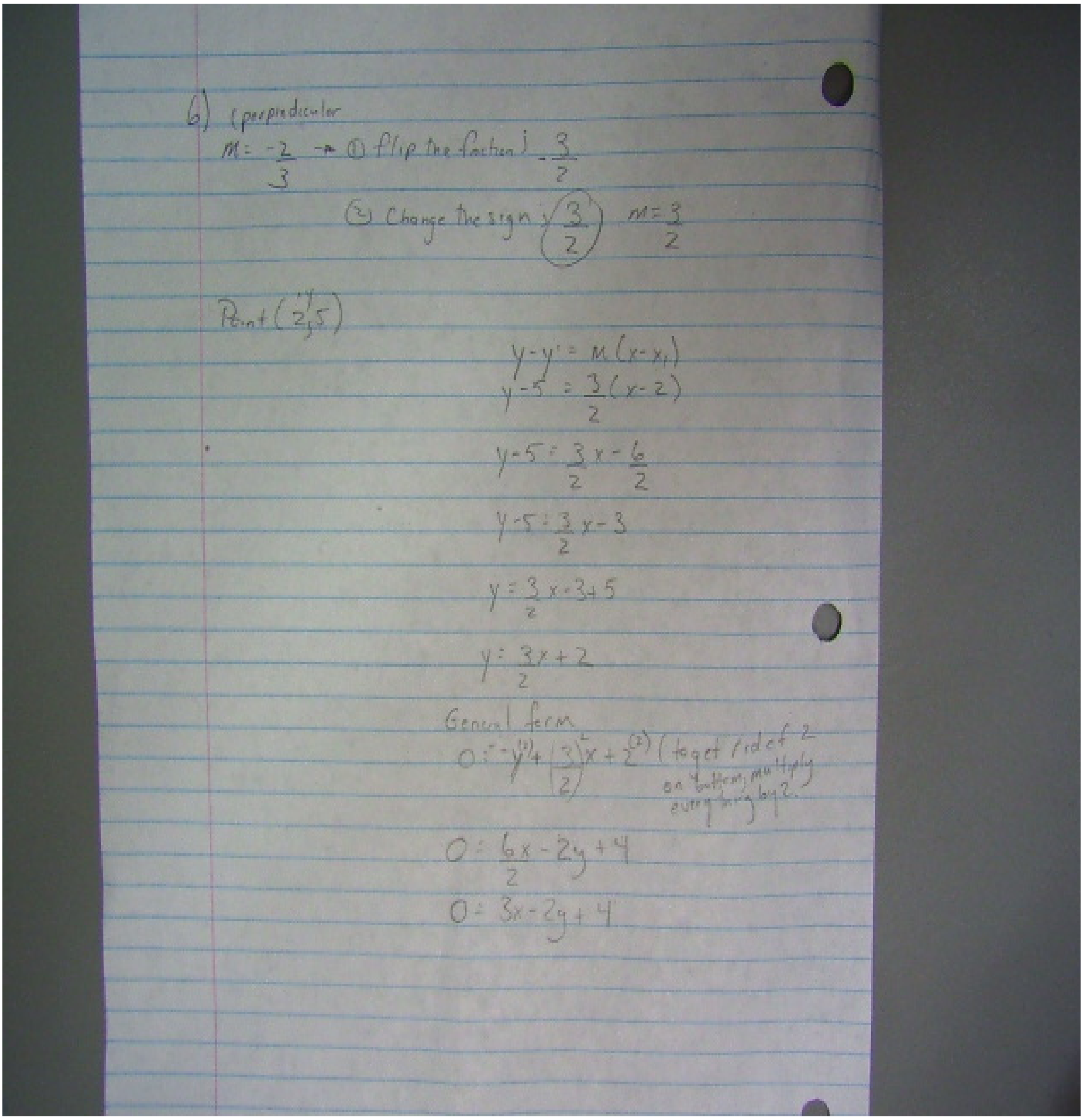
Point2 $(\overset{x2}{-1}, \overset{y2}{0})$

$\frac{7}{4} = \frac{0-p}{-1-3}$

$7(-1-3) = 4(0-p)$

$7(-4) = 4(-p)$

$\frac{-28}{-4} = \frac{\cancel{-4}p}{\cancel{-4}}$ $p=7$



6) (perpendicular

$m = \frac{-2}{3} \rightarrow$ ① flip the fraction) $-\frac{3}{2}$

② Change the sign) $\boxed{\frac{3}{2}}$ $m = \frac{3}{2}$

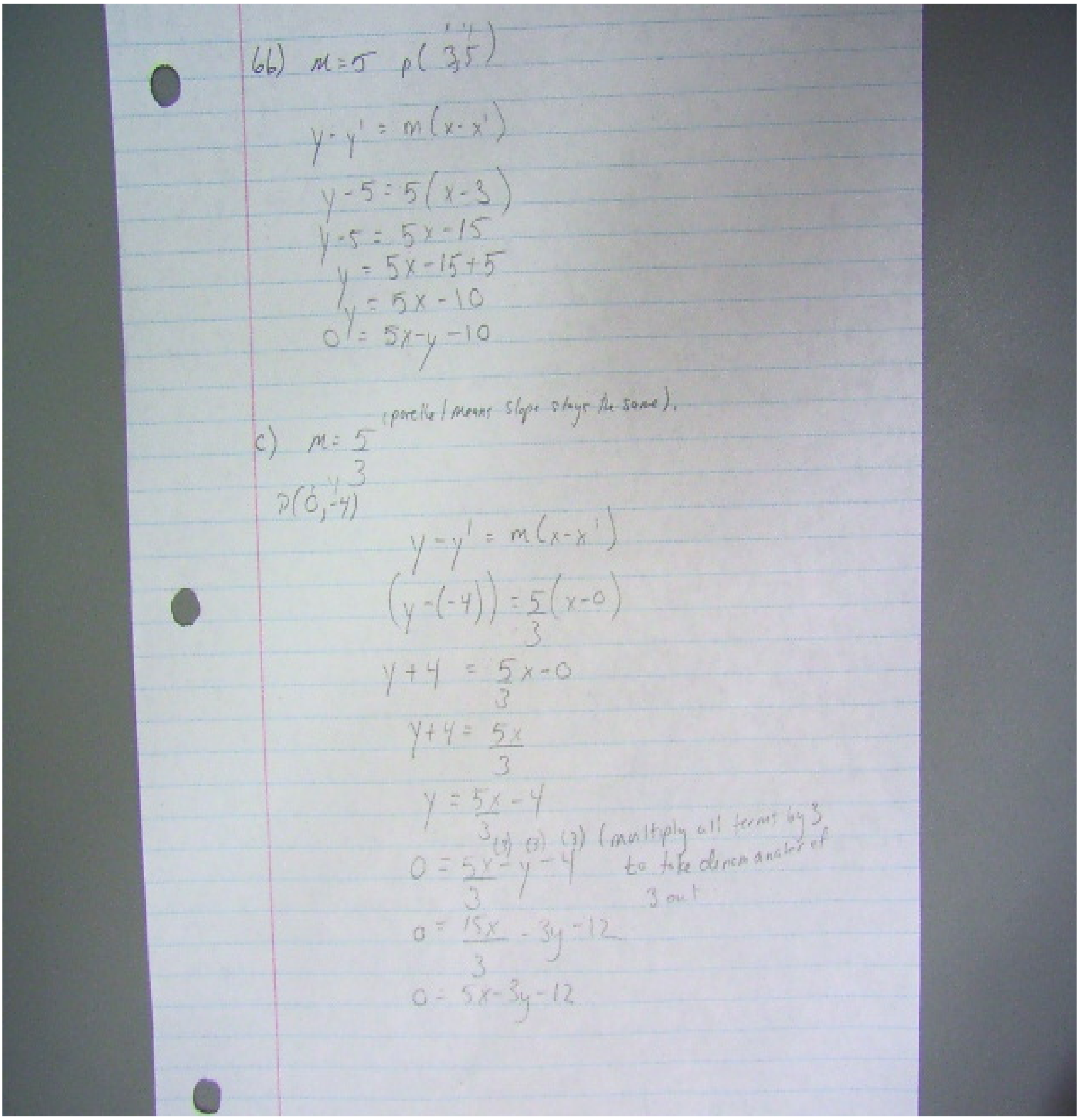
Point $(2, \overset{y}{5})$

$$y - y' = m(x - x_1)$$
$$y - 5 = \frac{3}{2}(x - 2)$$
$$y - 5 = \frac{3}{2}x - \frac{6}{2}$$
$$y - 5 = \frac{3}{2}x - 3$$
$$y = \frac{3}{2}x - 3 + 5$$
$$y = \frac{3}{2}x + 2$$

General form

$0 = -y^{(2)} + \left(\frac{3}{2}\right)^{2} x + 2^{(2)}$ (to get rid of 2 on bottom, multiply everything by 2.

$$0 = \frac{6x}{2} - 2y + 4$$
$$0 = 3x - 2y + 4$$



6b) $m=5 \quad p(\overset{'}{3}\overset{'}{5})$

$y-y'=m(x-x')$

$y-5=5(x-3)$

$y-5=5x-15$

$y=5x-15+5$

$y=5x-10$

$0=5x-y-10$

c) $m=\frac{5}{3}$ (parallel means slope stays the same).

$p(0,\overset{y'}{-4})$

$y-y'=m(x-x')$

$(y-(-4))=\frac{5}{3}(x-0)$

$y+4=\frac{5}{3}x-0$

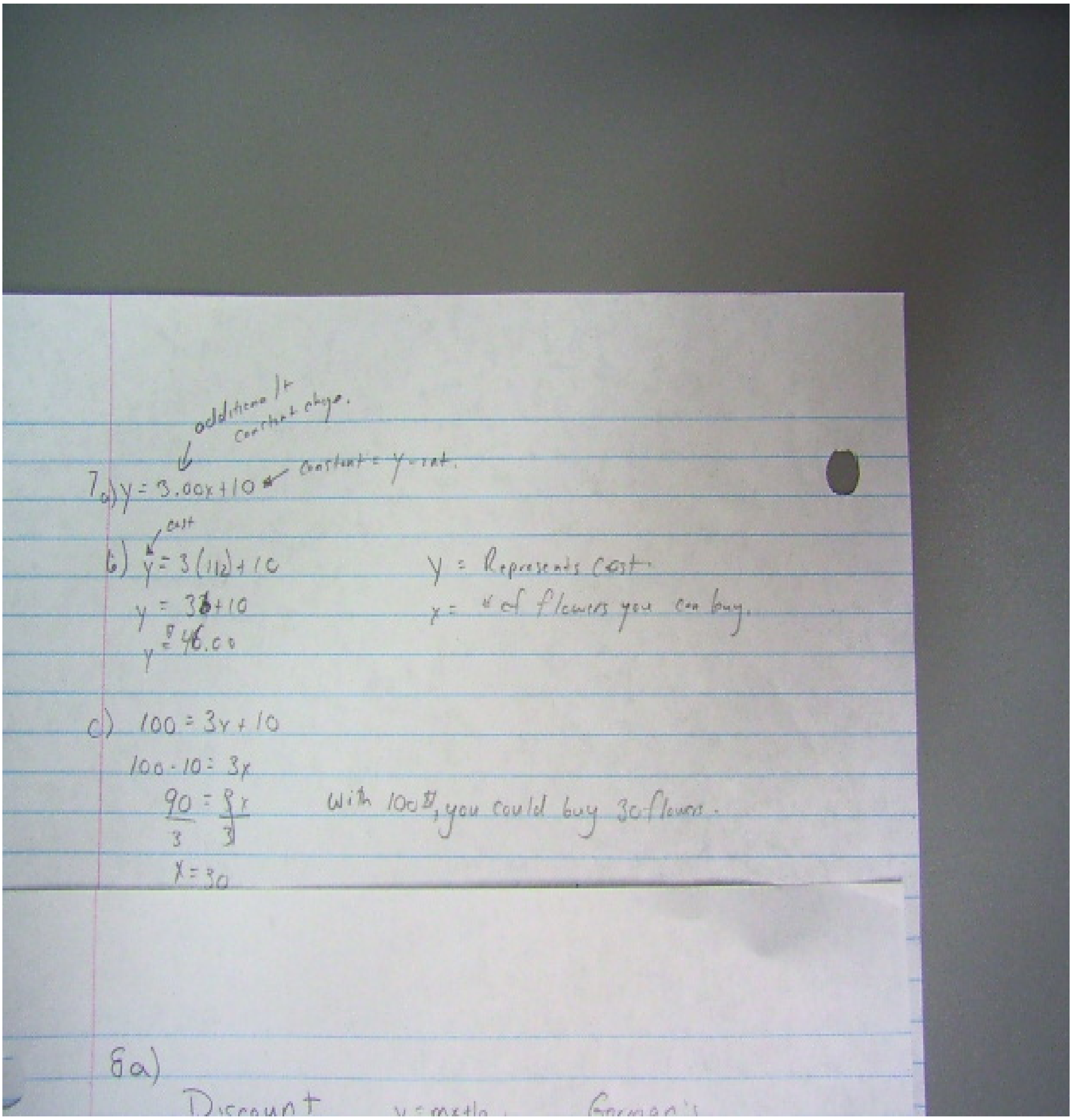
$y+4=\frac{5x}{3}$

$y=\frac{5x}{3}-4$

$0=\overset{(3)}{\frac{5x}{3}}-\overset{(3)}{y}-\overset{(3)}{4}$ (multiply all terms by 3 to take denomanator of 3 out

$0=\frac{15x}{3}-3y-12$

$0=5x-3y-12$



additional / constant chrge.

7 a) $y = 3.00x + 10 \leftarrow$ constant = y-int.

cost

b) $y = 3(12) + 10$

$y = 36 + 10$

$y = 46.00$

y = Represents cost

x = # of flowers you can buy.

c) $100 = 3x + 10$

$100 - 10 = 3x$

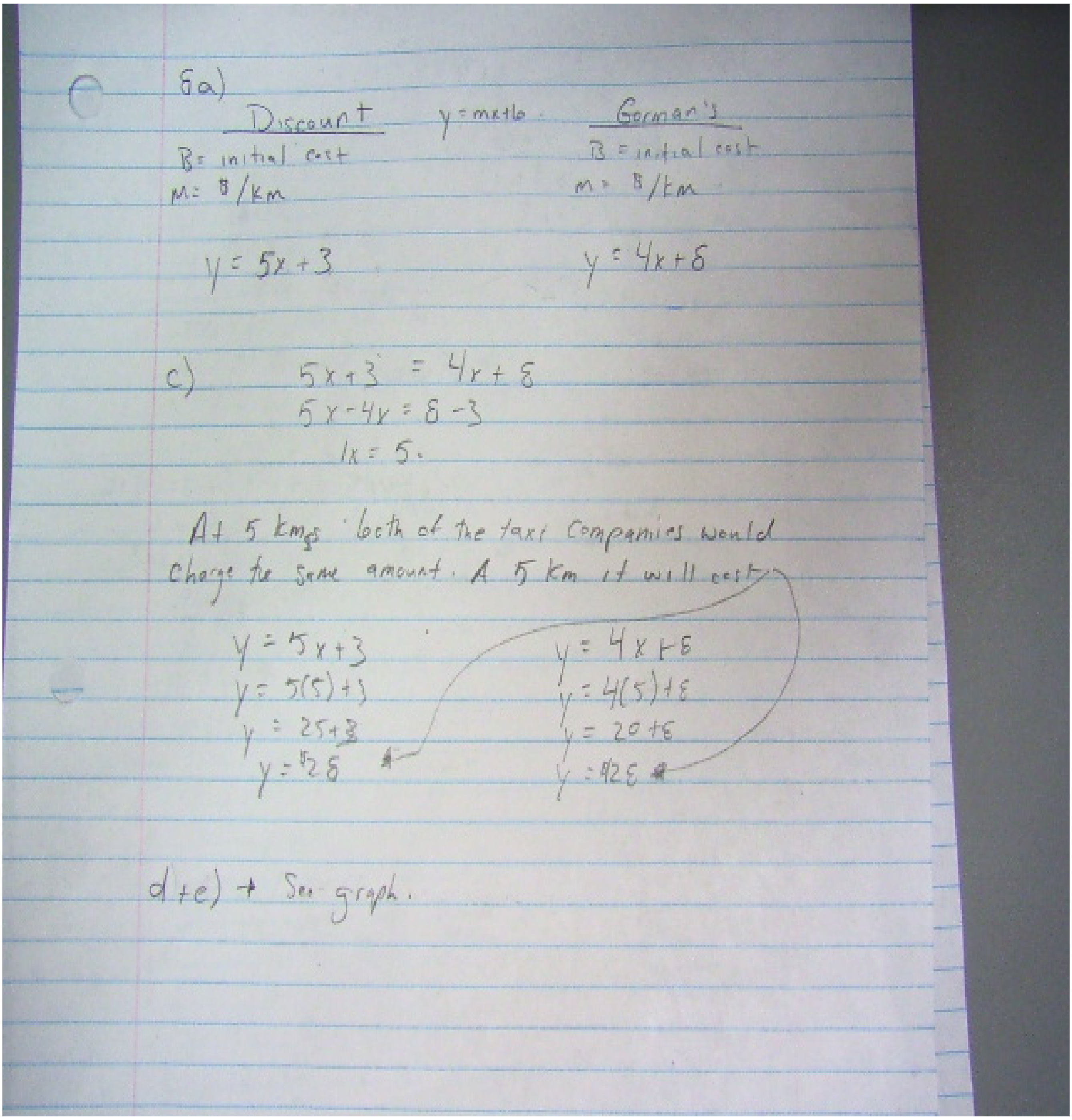
$\frac{90}{3} = \frac{3x}{3}$

$x = 30$

With 100$, you could buy 30 flowers.

8a)

Discount y = mx+b Gorman's



8a)

$y = mx + b$

Discount	Gorman's
$B =$ initial cost	$B =$ initial cost
$m = \$/km$	$m = \$/km$
$y = 5x + 3$	$y = 4x + 8$

c)

$5x + 3 = 4x + 8$

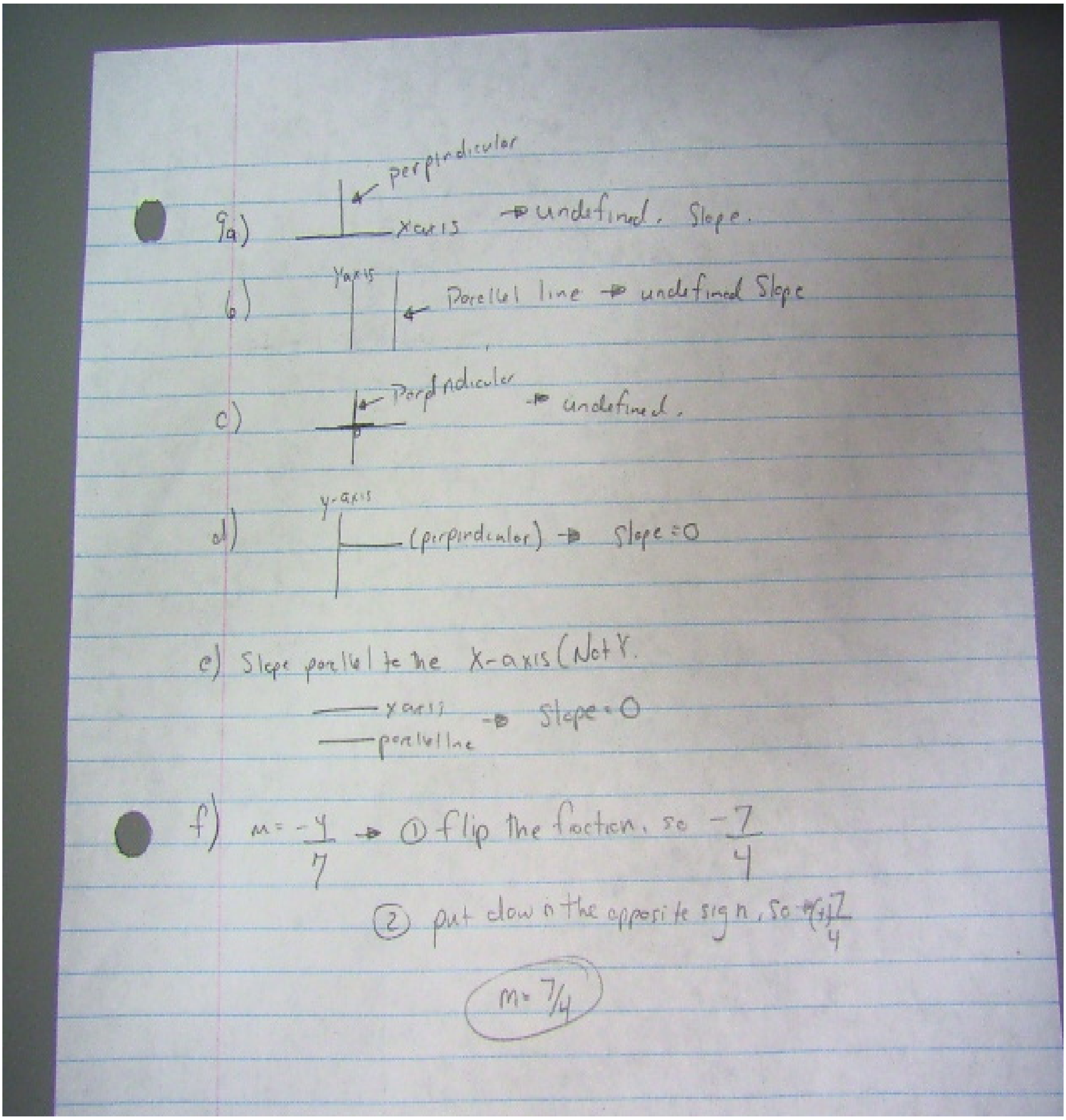
$5x - 4x = 8 - 3$

$1x = 5.$

At 5 kms both of the taxi companies would charge the same amount. A 5 km it will cost

$y = 5x + 3$	$y = 4x + 8$
$y = 5(5) + 3$	$y = 4(5) + 8$
$y = 25 + 3$	$y = 20 + 8$
$y = \$28$	$y = \$28$

d+e) → See graph.



9a) perpindiculer / x axis → undefind. Slope.

b) Y axis / Parellel line → undefined Slope

c) Perpindiculer → undefined.

d) y-axis / (perpindiculer) → slope = 0

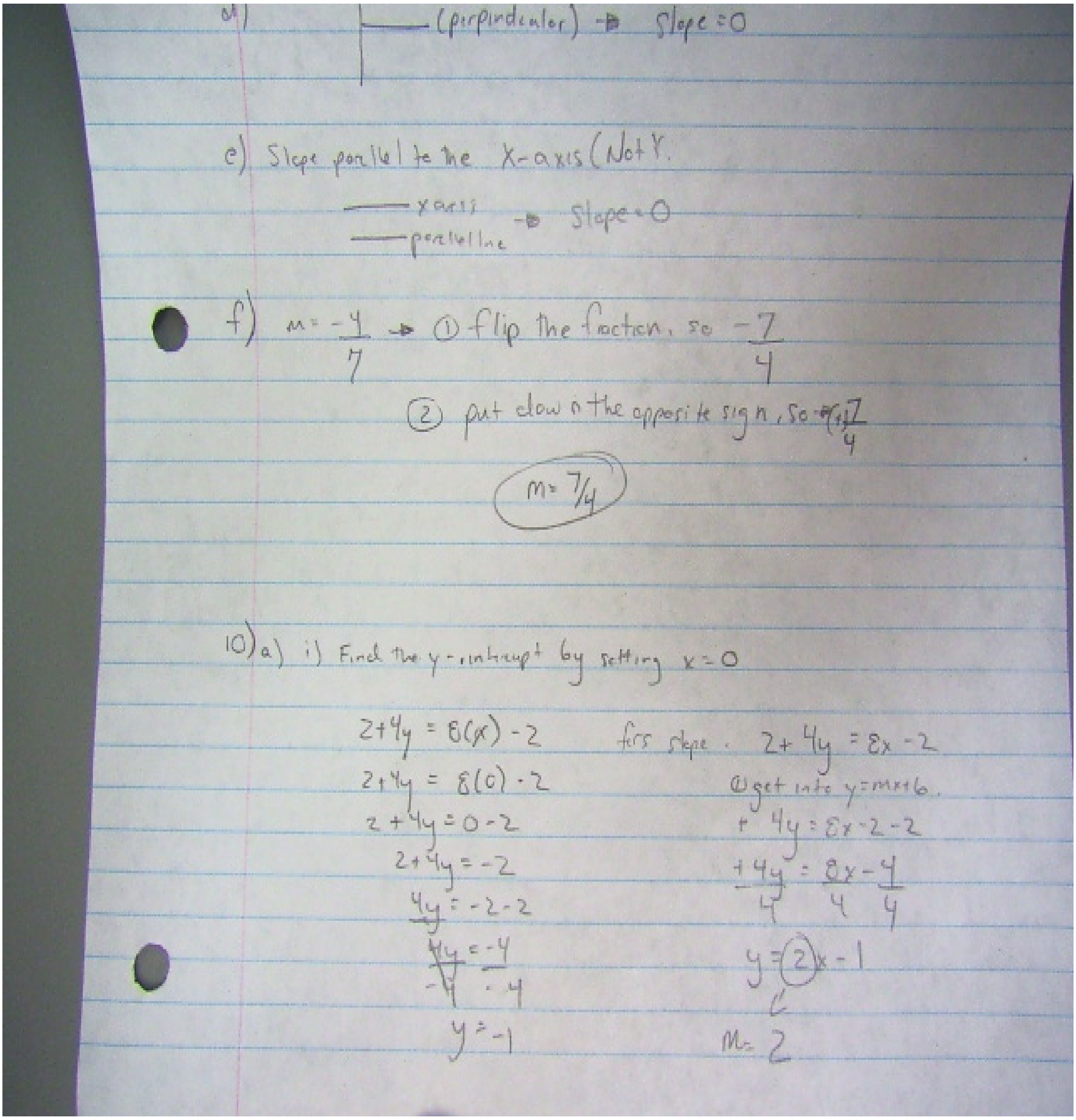
e) Slope parllel to the X-axis (Not Y.

x axis / parllel line → Slope = 0

f) $m = \frac{-4}{7}$ → ① flip the fraction, so $\frac{-7}{4}$

② put down the opposite sign, so (+)$\frac{7}{4}$

$m = 7/4$



d) (pirpindcular) → Slope = 0

e) Slope porllel to the X-axis (Not Y.

x axis, porllelline → Slope = 0

f) $m = \frac{-4}{7}$ → ① flip the fraction, so $\frac{-7}{4}$

② put down the opposite sign, so $\frac{7}{4}$

$\boxed{m = 7/4}$

10) a) i) Find the y-intercept by setting $x = 0$

$2 + 4y = 8(x) - 2$

$2 + 4y = 8(0) - 2$

$2 + 4y = 0 - 2$

$2 + 4y = -2$

$4y = -2 - 2$

$\frac{4y}{-4} = \frac{-4}{-4}$

$y = -1$

firs slope. $2 + 4y = 8x - 2$

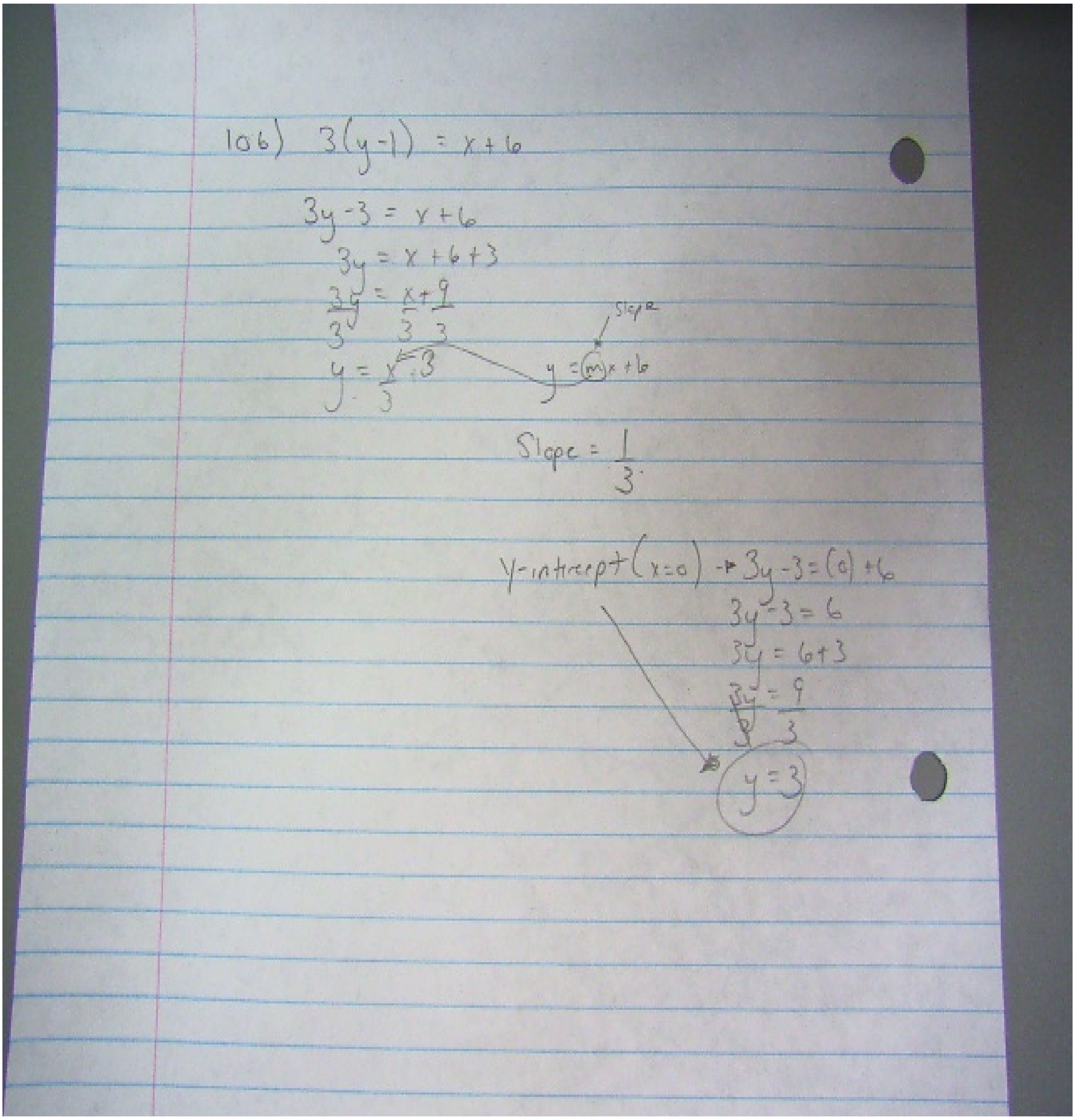
① get into $y = mx + b$.

$+ 4y = 8x - 2 - 2$

$\frac{+4y}{4} = \frac{8x}{4} - \frac{4}{4}$

$y = \textcircled{2}x - 1$

$m = 2$



106) $3(y-1) = x + 6$

$3y - 3 = x + 6$

$3y = x + 6 + 3$

$\frac{3y}{3} = \frac{x}{3} + \frac{9}{3}$

$y = \frac{x}{3} + 3$

slope

$y = \boxed{m}x + 6$

Slope $= \frac{1}{3}$

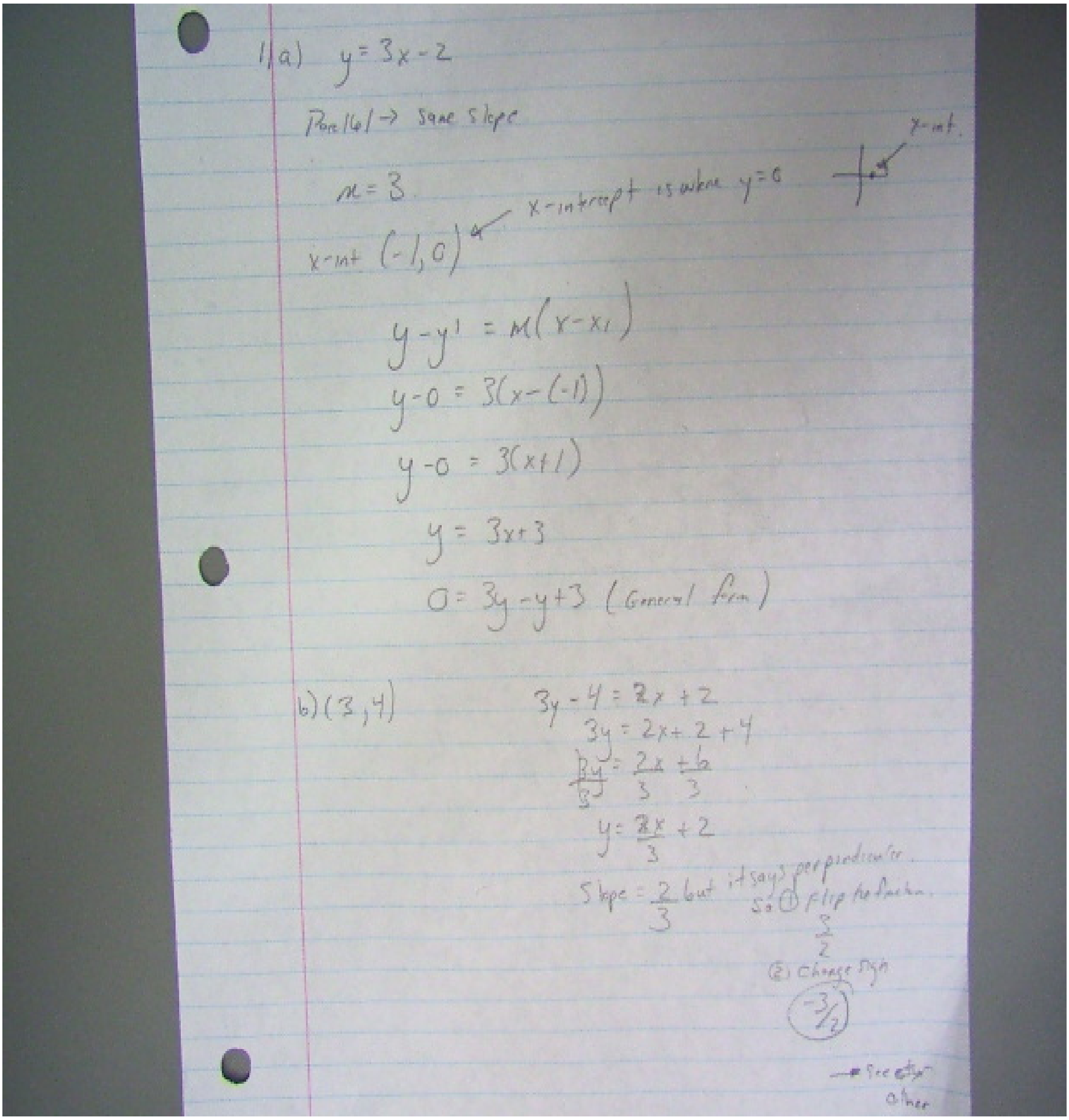
y-intrcept $(x=0)$ → $3y - 3 = (0) + 6$

$3y - 3 = 6$

$3y = 6 + 3$

$\frac{3y}{3} = \frac{9}{3}$

$\boxed{y = 3}$



1) a) $y = 3x - 2$

Parallel → same slope

$m = 3$

x-intercept is where $y = 0$

x-int.

x-int $(-1, 0)$

$$y - y^1 = m(x - x_1)$$

$$y - 0 = 3(x - (-1))$$

$$y - 0 = 3(x + 1)$$

$$y = 3x + 3$$

$$0 = 3y - y + 3$$ (General form)

b) $(3, 4)$

$$3y - 4 = 2x + 2$$

$$3y = 2x + 2 + 4$$

$$\frac{\cancel{3}y}{\cancel{3}} = \frac{2x}{3} + \frac{6}{3}$$

$$y = \frac{2x}{3} + 2$$

Slope $= \frac{2}{3}$ but it says perpendicular.

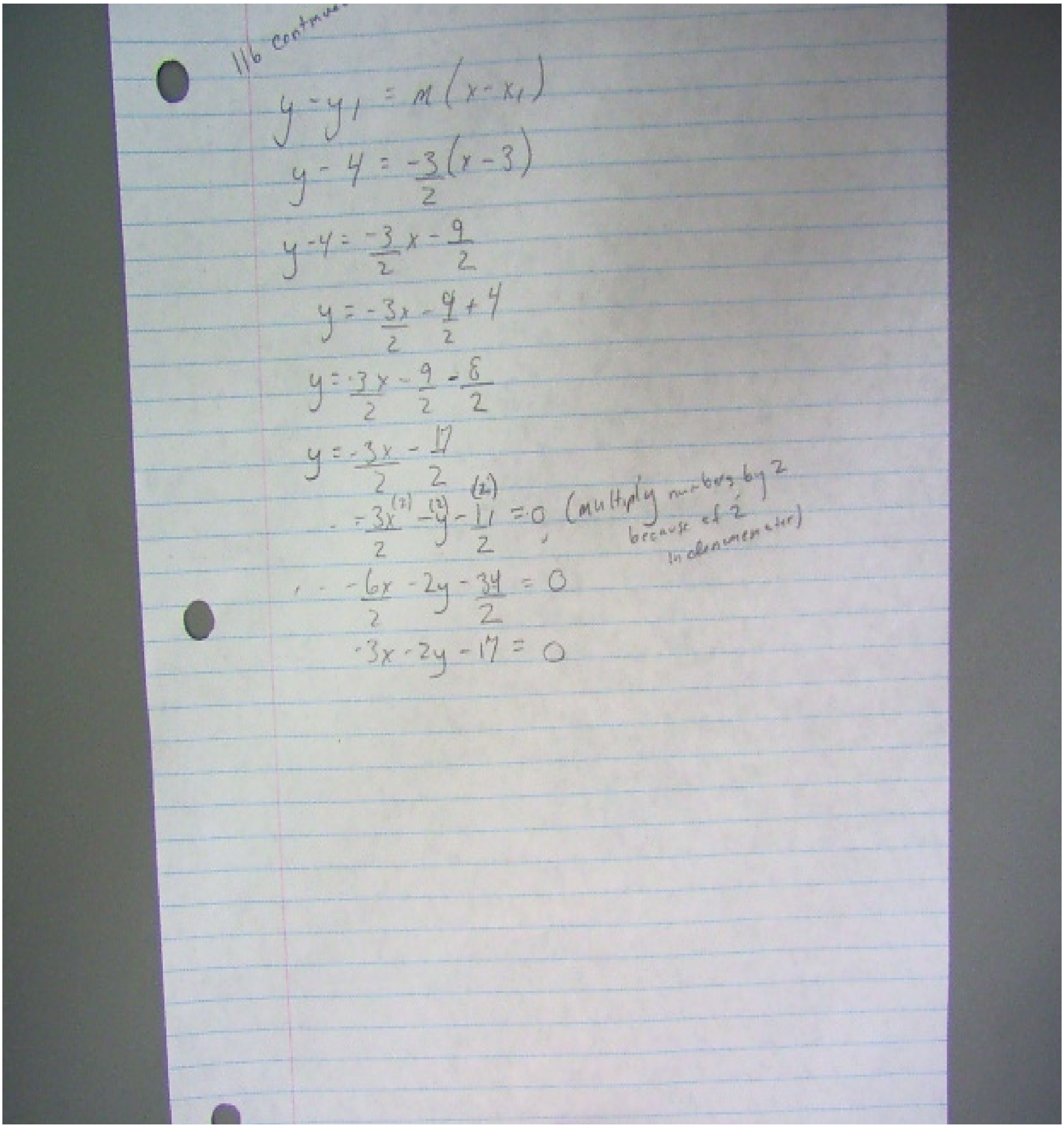
So ① flip the fraction.

$\frac{3}{2}$

② Change sign

$\boxed{-3/2}$

→ See other



116 continu

$$y - y_1 = m(x - x_1)$$

$$y - 4 = \frac{-3}{2}(x - 3)$$

$$y - 4 = \frac{-3}{2}x - \frac{9}{2}$$

$$y = \frac{-3x}{2} - \frac{9}{2} + 4$$

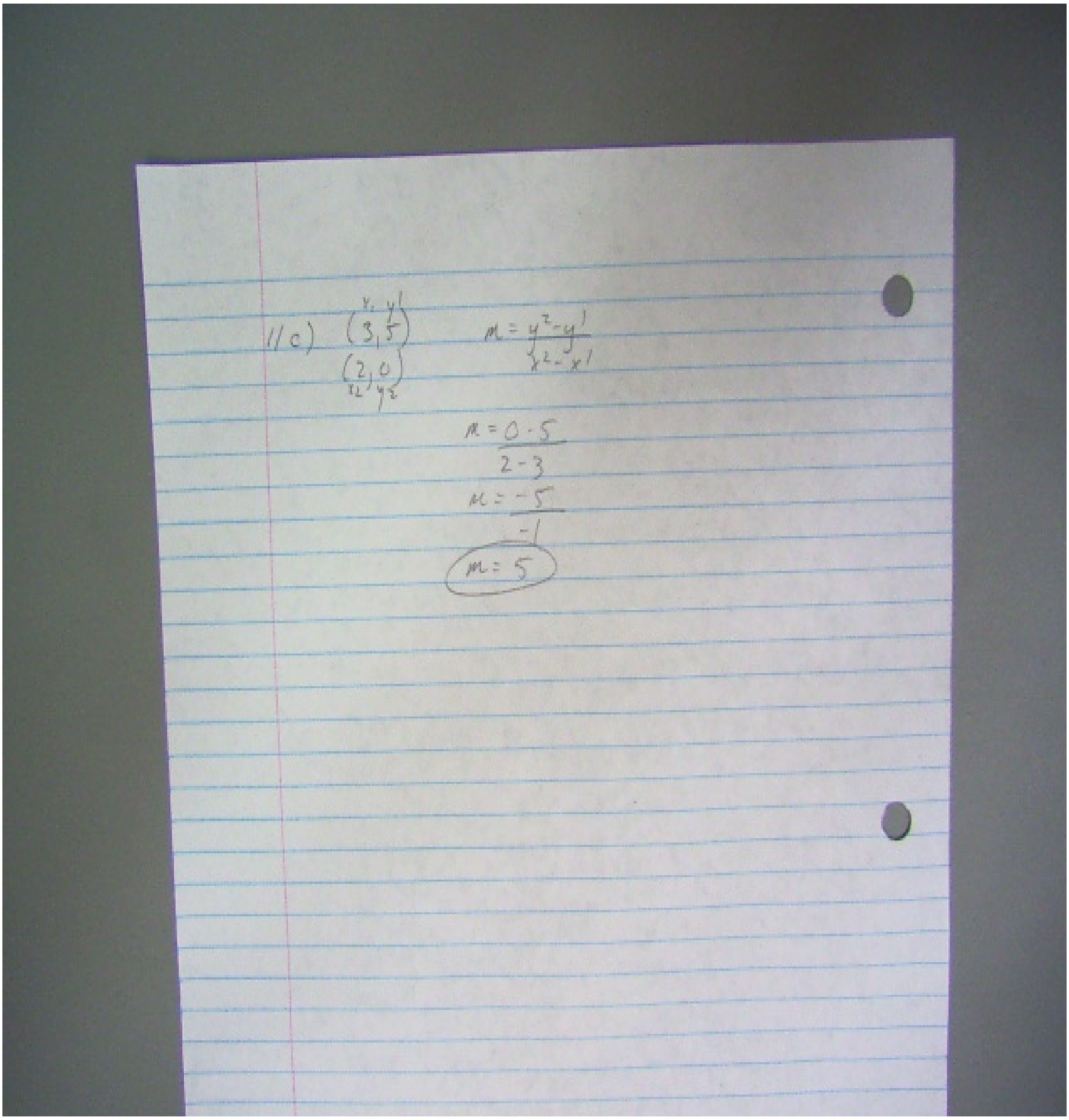
$$y = \frac{-3x}{2} - \frac{9}{2} - \frac{8}{2}$$

$$y = \frac{-3x}{2} - \frac{17}{2}$$

$$\frac{-3x^{(2)}}{2} - \overset{(2)}{y} - \frac{\overset{(2)}{17}}{2} = 0$$ (multiply numbers by 2 because of 2 in denominator)

$$\frac{-6x}{2} - 2y - \frac{34}{2} = 0$$

$$-3x - 2y - 17 = 0$$



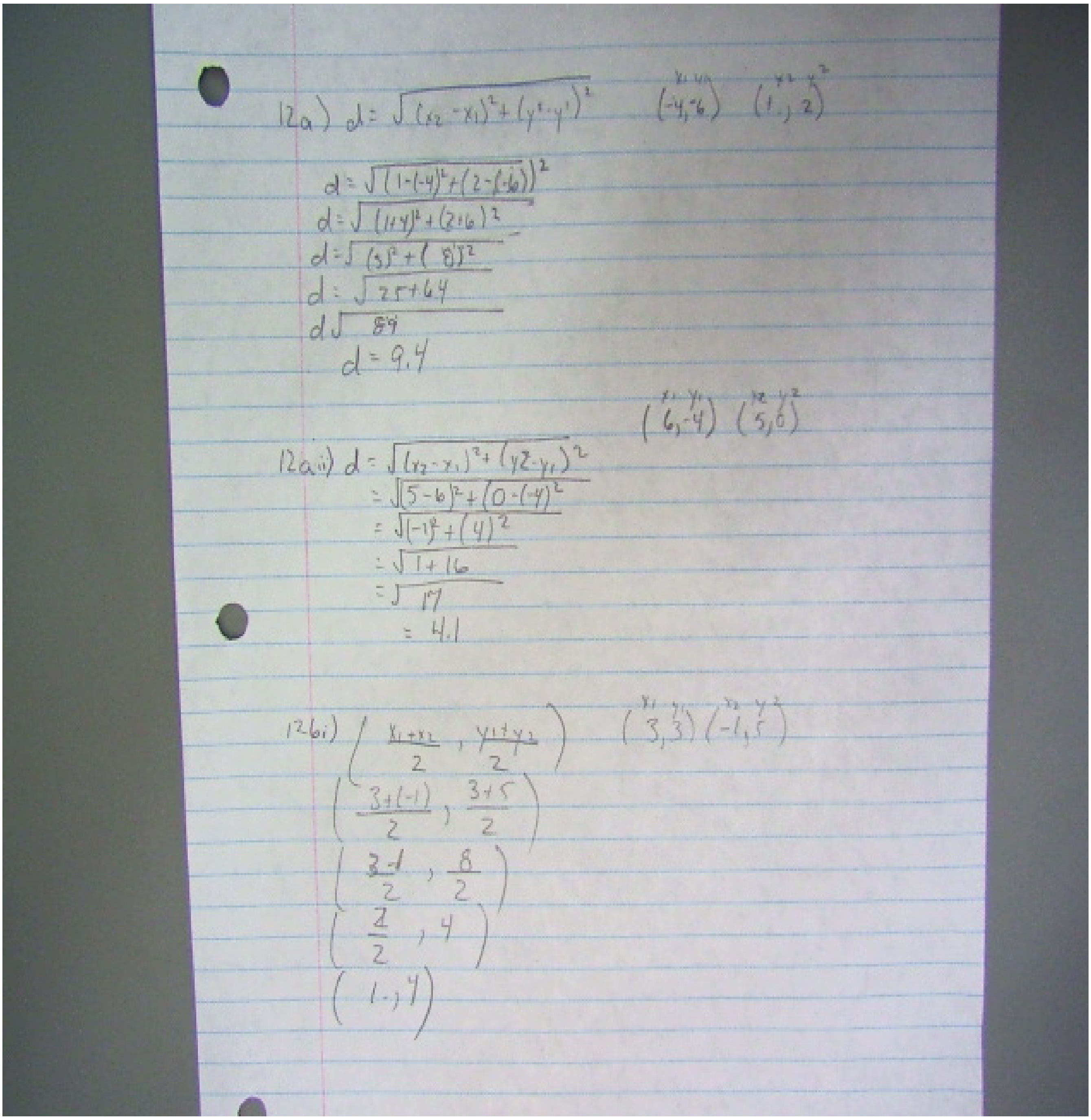
11c) $\left(\overset{x_1}{3},\overset{y_1}{5}\right)$ $\left(\underset{x_2}{2},\underset{y_2}{0}\right)$

$$m = \frac{y^2-y^1}{x^2-x^1}$$

$$m = \frac{0-5}{2-3}$$

$$m = \frac{-5}{-1}$$

$$\boxed{m=5}$$



12a) $d = \sqrt{(x_2 - x_1)^2 + (y^2 - y^1)^2}$ $(\overset{x_1}{-4}, \overset{y_1}{-6})$ $(\overset{x_2}{1}, \overset{y^2}{2})$

$d = \sqrt{(1-(-4)^2+(2-(-6))^2}$

$d = \sqrt{(1+4)^2+(2+6)^2}$

$d = \sqrt{(5)^2+(8)^2}$

$d = \sqrt{25+64}$

$d\sqrt{89}$

$d = 9.4$

$(\overset{x_1}{6}, \overset{y_1}{-4})$ $(\overset{x_2}{5}, \overset{y^2}{0})$

12aii) $d = \sqrt{(x_2-x_1)^2+(y2-y_1)^2}$

$= \sqrt{(5-6)^2+(0-(-4)^2}$

$= \sqrt{(-1)^2+(4)^2}$

$= \sqrt{1+16}$

$= \sqrt{17}$

$= 4.1$

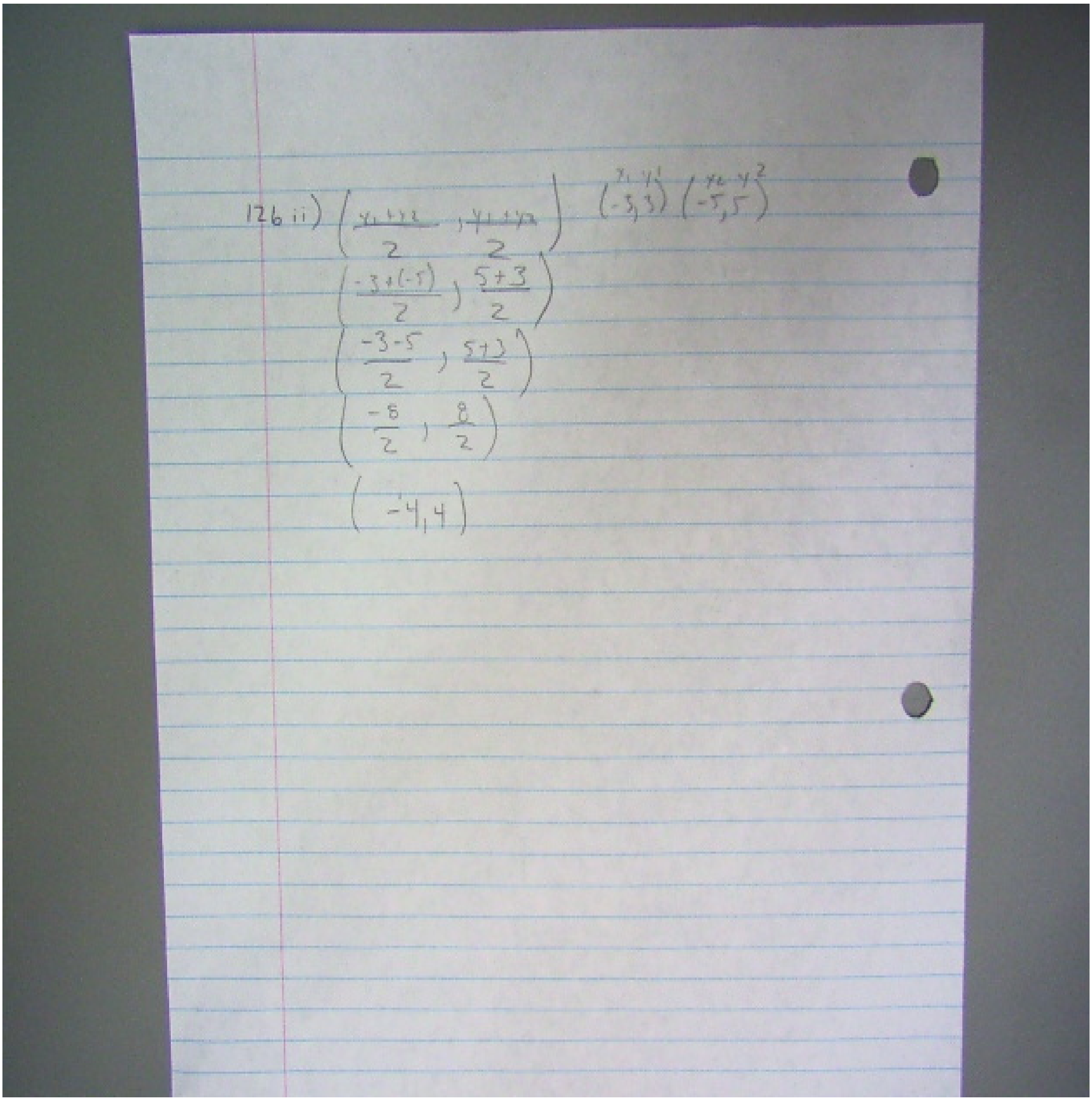
12bi) $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ $(\overset{x_1}{3}, \overset{y_1}{3})$ $(\overset{x_2}{-1}, \overset{y^2}{5})$

$\left(\frac{3+(-1)}{2}, \frac{3+5}{2}\right)$

$\left(\frac{3-1}{2}, \frac{8}{2}\right)$

$\left(\frac{2}{2}, 4\right)$

$(1,4)$



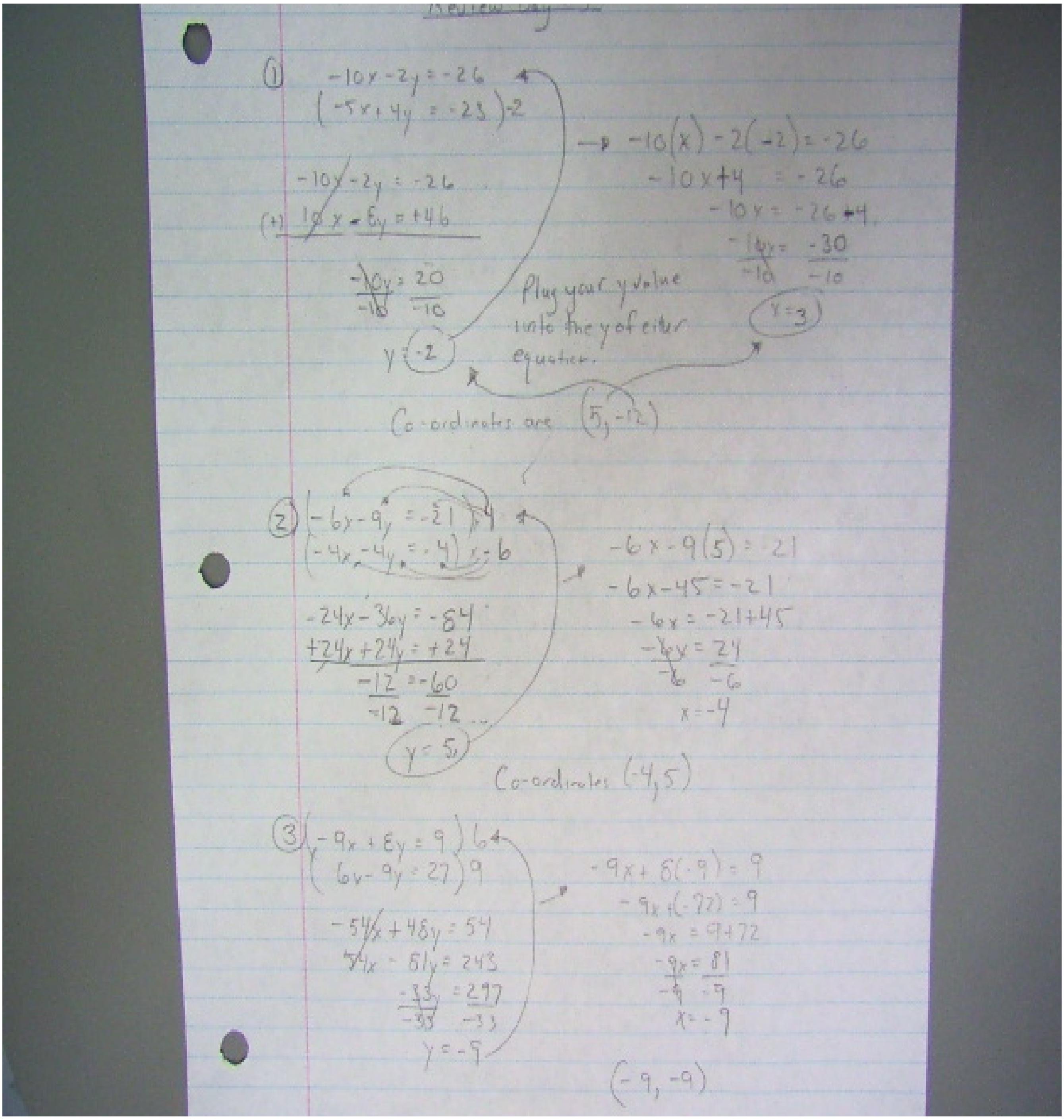
126 ii) $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ $(\overset{x_1}{-3}, \overset{y_1}{3})$ $(\overset{x_2}{-5}, \overset{y_2}{5})$

$$\left(\frac{-3+(-5)}{2}, \frac{5+3}{2}\right)$$

$$\left(\frac{-3-5}{2}, \frac{5+3}{2}\right)$$

$$\left(\frac{-8}{2}, \frac{8}{2}\right)$$

$$(-4, 4)$$



① $-10x-2y=-26$

$(-5x+4y=-23)-2$

$-10x-2y=-26$

(+) $10x-8y=+46$

$\frac{-10y}{-10}=\frac{20}{-10}$

$y=-2$

Plug your y value into the y of either equation.

$\rightarrow -10(x)-2(-2)=-26$

$-10x+4=-26$

$-10x=-26+4$

$\frac{-10x}{-10}=\frac{-30}{-10}$

$x=3$

Co-ordinates are $(5,-12)$

② $(-6x-9y=-21)\times4$

$(-4x-4y=-4)\times-6$

$-24x-36y=-84$

$+24x+24y=+24$

$\frac{-12}{-12}=\frac{-60}{-12}$

$y=5$

$-6x-9(5)=-21$

$-6x-45=-21$

$-6x=-21+45$

$\frac{-6x}{-6}=\frac{24}{-6}$

$x=-4$

Co-ordinates $(-4,5)$

③ $(-9x+8y=9)6$

$(6x-9y=27)9$

$-54x+48y=54$

$54x-81y=243$

$\frac{-33y}{-33}=\frac{297}{-33}$

$y=-9$

$-9x+8(-9)=9$

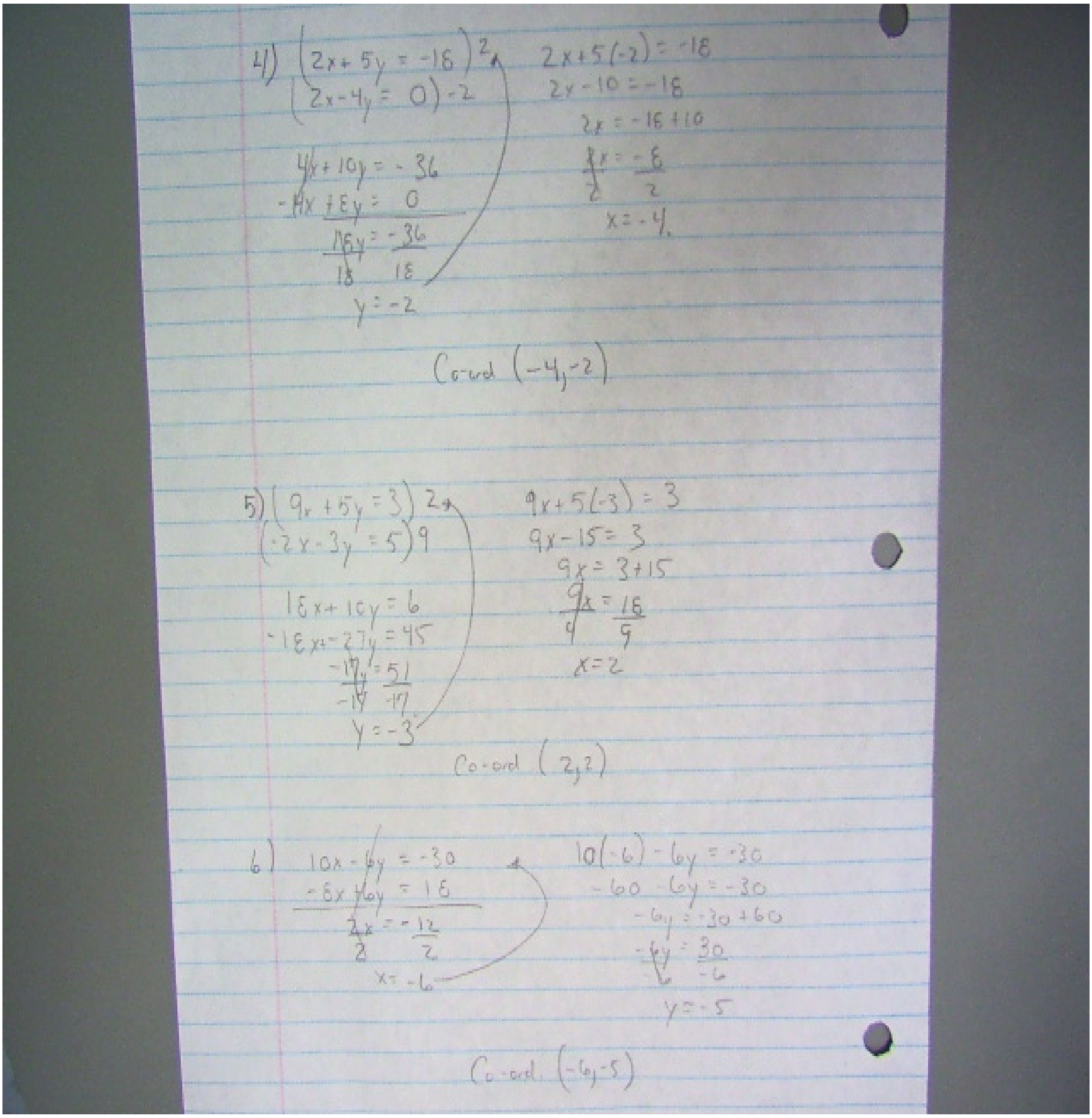
$-9x+(-72)=9$

$-9x=9+72$

$\frac{-9x}{-9}=\frac{81}{-9}$

$x=-9$

$(-9,-9)$



4) $(2x+5y=-18)2$

$(2x-4y=0)-2$

$4x+10y=-36$

$-4x+8y=0$

$\frac{18y}{18}=\frac{-36}{18}$

$y=-2$

$2x+5(-2)=-18$

$2x-10=-18$

$2x=-18+10$

$\frac{2x}{2}=\frac{-8}{2}$

$x=-4.$

Co-ord $(-4,-2)$

5) $(9x+5y=3)2$

$(-2x-3y=5)9$

$18x+10y=6$

$-18x-27y=45$

$\frac{-17y}{-17}=\frac{51}{-17}$

$y=-3$

$9x+5(-3)=3$

$9x-15=3$

$9x=3+15$

$\frac{9x}{9}=\frac{18}{9}$

$x=2$

Co-ord $(2,2)$

6) $10x-6y=-30$

$-8x+6y=18$

$\frac{2x}{2}=\frac{-12}{2}$

$x=-6$

$10(-6)-6y=-30$

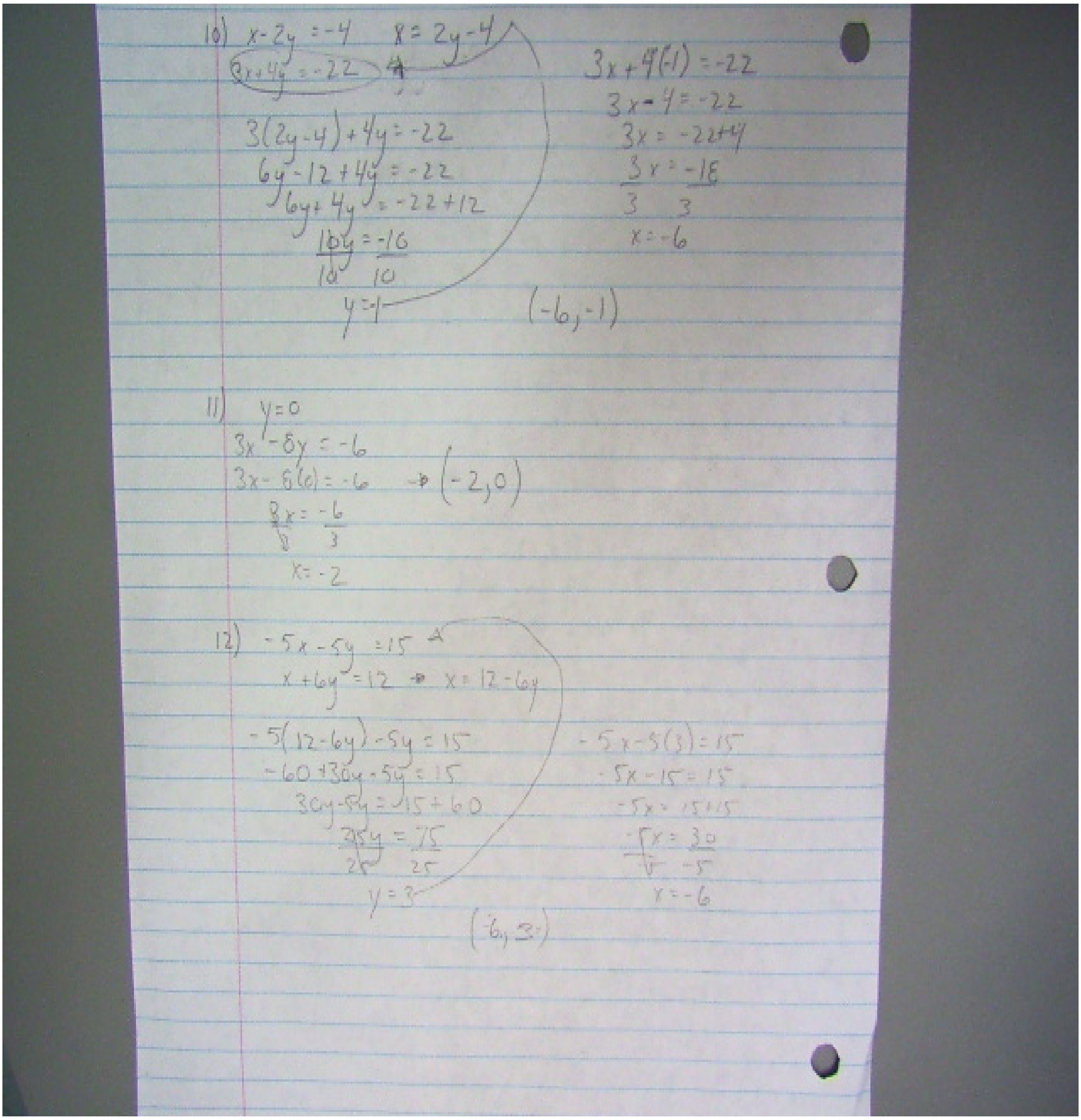
$-60-6y=-30$

$-6y=-30+60$

$\frac{-6y}{-6}=\frac{30}{-6}$

$y=-5$

Co-ord. $(-6,-5)$



10) $x - 2y = -4 \quad x = 2y - 4$

$3x + 4y = -22$

$3(2y - 4) + 4y = -22$

$6y - 12 + 4y = -22$

$6y + 4y = -22 + 12$

$\frac{10y}{10} = \frac{-16}{10}$

$y = -1$

$3x + 4(-1) = -22$

$3x - 4 = -22$

$3x = -22 + 4$

$\frac{3x}{3} = \frac{-18}{3}$

$x = -6$

$(-6, -1)$

11) $y = 0$

$3x - 8y = -6$

$3x - 8(0) = -6 \rightarrow (-2, 0)$

$\frac{3x}{3} = \frac{-6}{3}$

$x = -2$

12) $-5x - 5y = 15$

$x + 6y = 12 \rightarrow x = 12 - 6y$

$-5(12 - 6y) - 5y = 15$

$-60 + 30y - 5y = 15$

$30y - 5y = 15 + 60$

$\frac{25y}{25} = \frac{75}{25}$

$y = 3$

$-5x - 5(3) = 15$

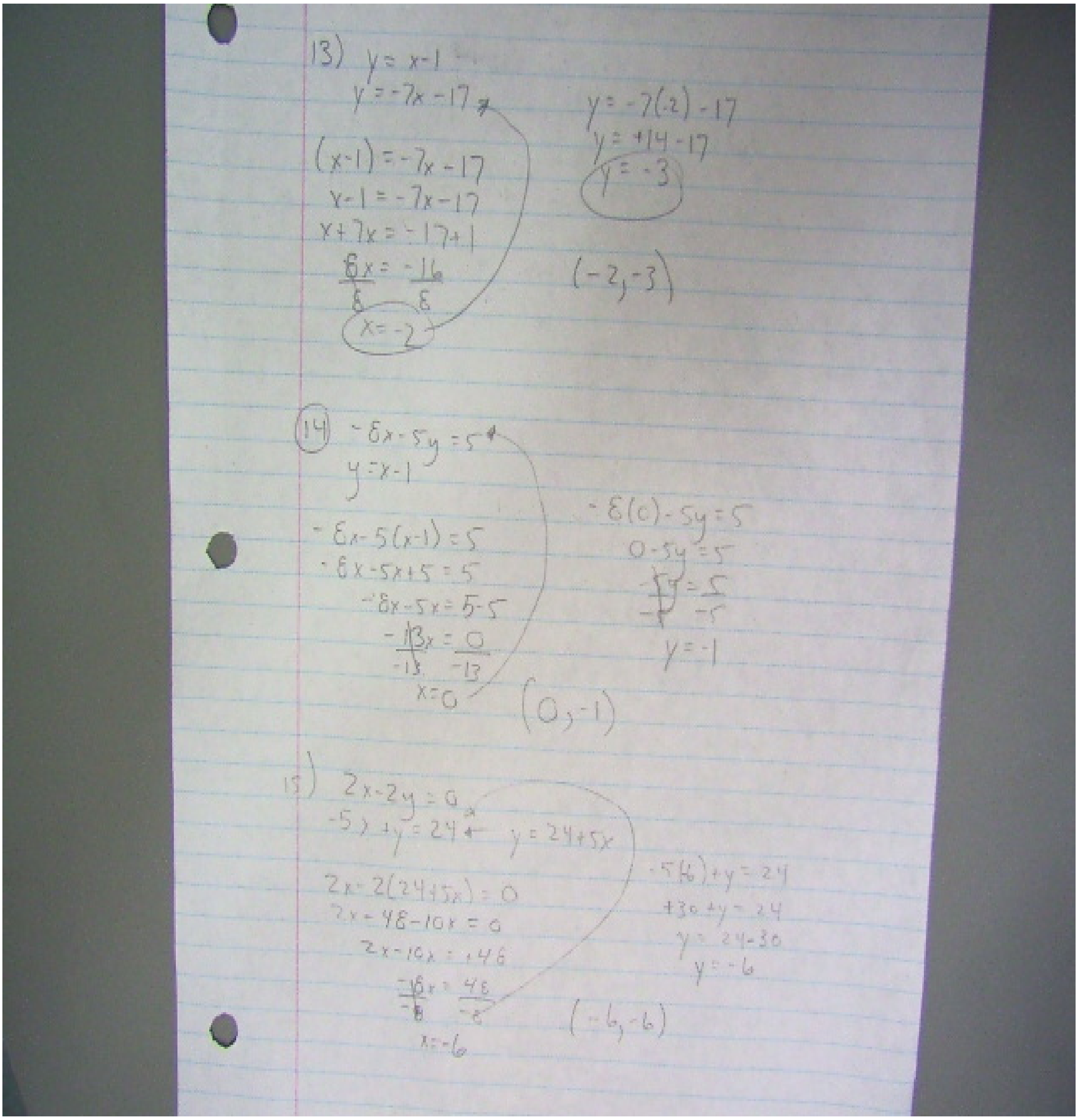
$-5x - 15 = 15$

$-5x = 15 + 15$

$\frac{-5x}{-5} = \frac{30}{-5}$

$x = -6$

$(-6, 3)$



13) $y = x - 1$
$y = -7x - 17$

$(x-1) = -7x - 17$
$x - 1 = -7x - 17$
$x + 7x = -17 + 1$
$\frac{8x}{8} = \frac{-16}{8}$
$\boxed{x = -2}$

$y = -7(-2) - 17$
$y = +14 - 17$
$\boxed{y = -3}$

$(-2, -3)$

⑭ $-8x - 5y = 5$
$y = x - 1$

$-8x - 5(x-1) = 5$
$-8x - 5x + 5 = 5$
$-8x - 5x = 5 - 5$
$\frac{-13x}{-13} = \frac{0}{-13}$
$x = 0$

$-8(0) - 5y = 5$
$0 - 5y = 5$
$\frac{\cancel{-5}y}{\cancel{-5}} = \frac{5}{-5}$
$y = -1$

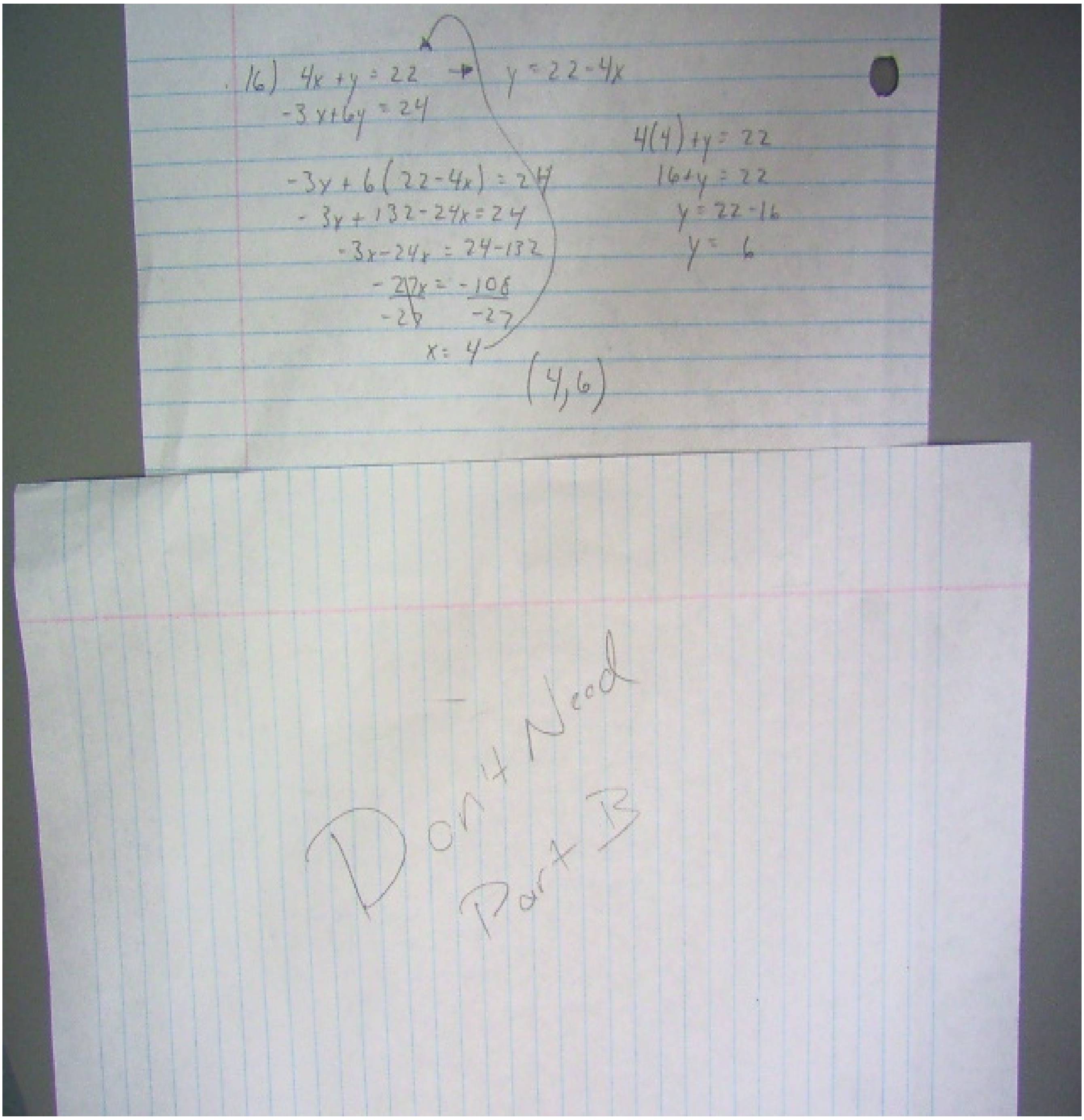
$(0, -1)$

15) $2x - 2y = 0$
$-5x + y = 24 \leftarrow$ $y = 24 + 5x$

$2x - 2(24 + 5x) = 0$
$2x - 48 - 10x = 0$
$2x - 10x = +48$
$\frac{-8x}{-8} = \frac{48}{-8}$
$x = -6$

$-5(6) + y = 24$
$+30 + y = 24$
$y = 24 - 30$
$y = -6$

$(-6, -6)$



16) $4x + y = 22 \rightarrow y = 22 - 4x$

$-3x + 6y = 24$

$-3x + 6(22 - 4x) = 24$

$-3x + 132 - 24x = 24$

$-3x - 24x = 24 - 132$

$\frac{-\cancel{27}x}{-\cancel{27}} = \frac{-108}{-27}$

$x = 4$

$4(4) + y = 22$

$16 + y = 22$

$y = 22 - 16$

$y = 6$

$(4, 6)$

Don't Need Part B