

Warning: There is a 75 pt.  
part on older material.

(new material) 50 pts.  
MAC 1105 REVIEW FOR FINAL

(5) (1) a) The doubling time for  
e-coli bacteria is 25 minutes.

If 2,000 are present initially,  
how many are there after  
45 minutes? OR

b) Radioactive gold has a  
half-life of 2.67 days. If  
we start with 50 mg. of it,  
how much remains after  
8 days?

(10) (2) Solve by the elimination  
method:

$$3x - 2y = 8$$

$$2x + 5y = -1$$

(10) (3) A parking meter has only  
nickels and dimes worth \$6.05.  
If there are 89 coins in all,  
how many of each are there?  
Use algebra.

(10) (4) Solve:

$$x^2 - y^2 = 5$$

$$x^2 + 2y^2 = 17$$

(5) (5) Set up, but don't solve:

The area of a rectangle is  
32 square meters, and its  
perimeter is 36 meters.

(10) (6) Solve by graphing and  
find all corner pts. (algebraically).

$$x + y \geq 6$$

$$2x - y \geq 0$$

Warning: There is a 75 pt. part on older material,  
MAC 1105 (new material) SOLUTIONS

① a)  $A = A_0 \cdot 2^{t/d}$   
 $= 2000 \cdot 2^{45/15}$   
 $= 6964$

b)  $A = A_0 \cdot 2^{-t/h}$   
 $= 50 \cdot 2^{-8/2.67}$   
 $\approx 6.27 \text{ mg.}$

②  $6x - 4y = 16$   
 $-6x - 15y = 3$   


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 $-19y = 19 \Rightarrow y = -1$   
 $6x - 4(-1) = 16$   
 $6x = 12 \Rightarrow x = 2$

OR  
 $15x - 10y = 40$   
 $4x + 10y = -2$   


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 $19x = 38 \Rightarrow x = 2$   
 $3(2) - 2y = 8$   
 $-2 = 2y \Rightarrow y = -1$

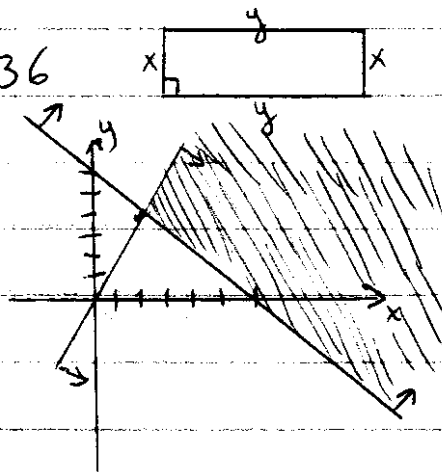
③  $x = \text{no. of nickels}$   
 $y = \text{no. of dimes}$   
 $x + y = 89 \Rightarrow y = 89 - x (*)$   
 $5x + 10y = 605$   
 $5x + 10(89 - x) = 605$   
 $5x + 890 - 10x = 605$   
 $285 = 5x$   
 $x = 57, y = 89 - 57$   
 $= 32$   
 57 nickels, 32 dimes.

④  $x^2 - y^2 = 5$   
 $-x^2 - 2y^2 = -17$   


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 $-3y^2 = -12 \Rightarrow y^2 = 4 \Rightarrow y = \pm 2$   
 $x^2 - 4 = 5$   
 $x^2 = 9 \Rightarrow x = \pm 3$   
 $(3, -2) (3, 2) (-3, -2) (-3, +2)$

⑤  $xy = 32$   
 $2x + 2y = 36$



⑥  $x + y = 6$   
 $2x - y = 0$   


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 $3x = 6$   
 $x = 2 \Rightarrow y = 4$