

Review Packet B

Name _____

39) Solve the following inequality: $-8 \leq 3x + 1 < 7$

$$\begin{aligned} -8 &\leq 3x + 1 < 7 \\ -9 &\leq 3x < 6 \\ -3 &\leq x < 2 \end{aligned}$$

- a) $-5 \leq x < -3.5$ b) $-4 \leq x < 2$ c) $-1 \leq x < 0.5$ d) $-3 \leq x < 2$

40) At Rhonda's diner, six loaded baked potatoes and four cheeseburgers provide 5540 calories.

Two loaded baked potatoes and three cheeseburgers provide 2830 calories. Find the calorie content of each item.

$$\begin{aligned} 6p + 4c &= 5540 \rightarrow 6p + 4c = 5540 \\ 2p + 3c &= 2830 \rightarrow -6p - 9c = -8490 \\ \hline -5c &= -2950 \\ c &= 590 \end{aligned}$$

a) potato: 520 calories, cheeseburger: 550 calories

b) potato: 550 calories, cheeseburger: 520 calories

c) potato: 580 calories, cheeseburger: 500 calories

d) potato: 530 calories, cheeseburger: 590 calories

$$2p + 3(590) = 2830$$

$$2p + 1770 = 2830$$

$$\begin{aligned} 2p &= 1060 \\ p &= 530 \checkmark \end{aligned}$$

41) When making a long distance call from a certain pay phone, the first three minutes of a call cost \$1.40. After that, each additional minute or portion of a minute of that call costs \$0.35. Find the maximum number of minutes one can call long distance for \$5.60.

$$1.40 + .35m = 5.60$$

$$.35m = 4.20$$

$$m = 12$$

m = min. beyond 1st 3 min.

a) 15 minutes

b) 16 minutes

c) 17 minutes

d) 12 minutes

$$1.40 + 0.35(m-3) = 5.60$$

$$1.40 + .35m - 1.05 = 5.60$$

$$.35m + .35 = 5.60$$

$$.35m = 5.25$$

42) Chelsea has nickels, dimes, and quarters in her coin purse. She has a total of \$2.80 from 20 coins. The number of quarters is two more than the number of nickels. The number of dimes is one more than the number of quarters. How many nickels did she have?

$$n + q + 1 + q = 20$$

$$n + n + 2 + 1 + n + 2 = 20$$

$$3n + 5 = 20$$

a) 3 nickels

b) 4 nickels

c) 5 nickels

d) 6 nickels

$$3n = 15$$

$$n = 5$$

$$n + d + q = 20$$

$$q = n + 2$$

$$d = q + 1$$

$$.05n + .10d + .25q = 20$$

didn't need

43) Solve using the substitution method:

$$2x - 9y = 23$$

$$y = 6x + 9$$

$$\rightarrow 2x - 9(6x + 9) = 23$$

$$2x - 54x - 81 = 23$$

$$-52x = 104$$

$$x = -2$$

$$y = 6(-2) + 9$$

$$y = -12 + 9$$

a) (3, 27)

b) (2, 21)

c) (-2, -3)

d) (-3, -9)

44) On a buying trip in Los Angeles, Rosaria Perez ordered 120 pieces of jewelry: a number of bracelets at \$8 each and a number of necklaces at \$15 each. She wrote a check for \$1310 to pay for the order. How many bracelets and how many necklaces did Rosaria purchase?

$$\begin{array}{r} 8b + 15n = 1310 \\ -8b + 8n = -960 \quad \leftarrow b + n = 120 \\ \hline 7n = 350 \quad n = 50 \end{array}$$

a) 70 bracelets and 50 necklaces

b) 55 bracelets and 65 necklaces

c) 60 bracelets and 60 necklaces

d) 64 bracelets and 56 necklaces

45) Solve the following system by graphing:

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

$$y = 3x + 11$$

$$\rightarrow 4x + 2(3x + 11) = -8 \text{ subst}$$

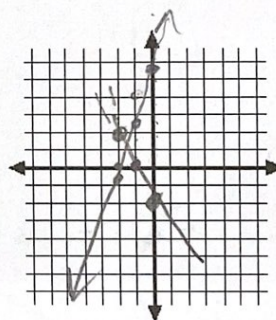
$$(0, -4) \quad (-2, 0)$$

a) (-2, 1)

b) (1, 3)

c) (-3, 2)

d) (-1, 2)

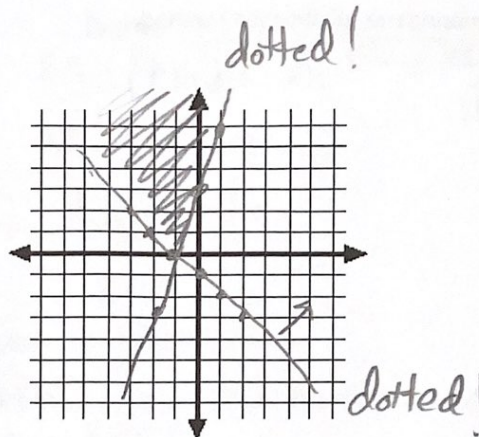


Graph knowledge req.?

46) Graph the following system of inequalities on the graph shown.

$$y > 3x + 3$$

$$x + y > -1$$



Use the following word problem for #47 – 50:

The Discrete quiz consists of computation problems and graphing problems. Computation problems are worth 5 points each, and graphing problems are worth 10 points each. You can answer a computation problem in 2 minutes and a graphing problem takes 5 minutes. You have 40 minutes to take the quiz and may choose no more than 14 problems to answer. Let x equal the number of computation problems that a student gets correct. Let y equal the number of graphing problems a student gets correct on the quiz.

$$z = 5x + 10y$$

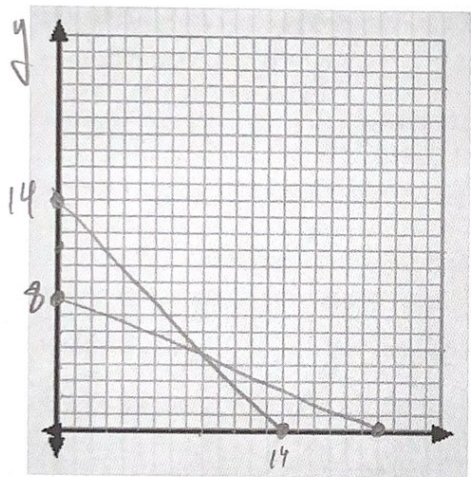
47) What is the objective function for this situation?

a) $z = 5x + 10y$

b) $z = 2x + 4y$

c) $z = 40x + 12y$

d) none of these



48) Which of the following inequalities is NOT one of the constraints for this situation?

a) $x + y \leq 14$

b) $5x + 10y \geq 40$

c) $2x + 5y \leq 40$

d) $x \geq 0$

49) Which of the following is NOT one of the vertices of the polygon formed by the constraints?

$$5(14) = 70$$

$$5(10) + 10(4) = 90$$

a) (14, 0)

b) (10, 4)

c) (0, 8)

d) (20, 0)

$$5(0) + 10(8) = 80$$

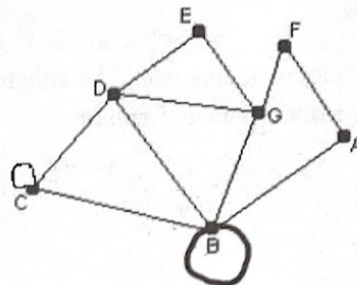
50) Assuming you get all the problems you do correct, how many of each type should you answer to get the highest number of points?

- a) 14 computational b) 20 graphing
c) 8 graphing d) ten computational and four graphing

For # 51 – 53, use the graph shown.

51) Is the graph complete? Is it connected?

No Yes



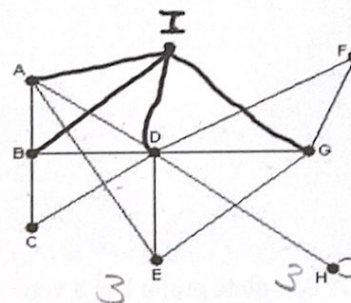
52) Is the edge FA is a bridge?

No

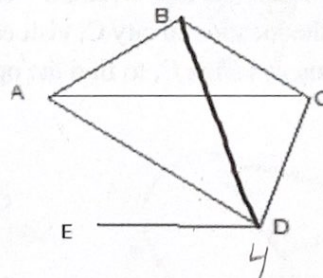
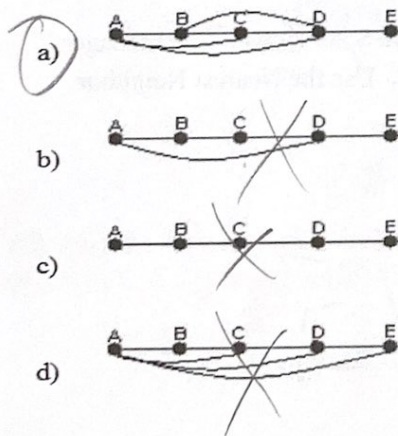
53) Find the degree of vertex B.

6

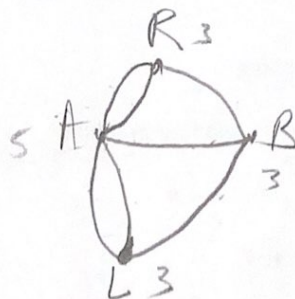
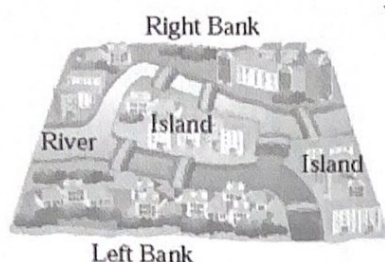
54) Does the graph have an Euler Path, an Euler Circuit, or neither?



55) Which of the following graphs is equivalent to the one shown?



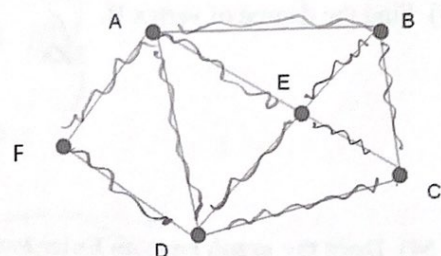
56) The layout of a city with land masses and bridges is shown. Draw a graph to model the land masses and bridges.



Determine if the city residents would be able to walk across all of the bridges (starting on either bank) without crossing the same bridge twice. Explain.

No, not Euler Path — too many odd vertices

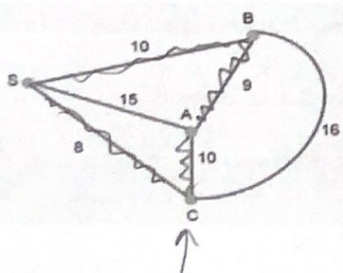
57) For the graph shown, C E B C D E A D F A B is best described as an Euler Circuit, an Euler Path, a Hamilton Path, or a Hamilton Circuit?



58) A complete graph has 8 vertices. How many Hamilton Circuits exist?

$$7! = 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 42 \cdot 120 = 5040$$

59) A restaurant chain has four different locations in different cities, A, B, C, and S, as shown. The manager needs to start at the location in city C, visit each restaurant, and return to city C. Use the Nearest Neighbor Algorithm, starting at vertex C, to find the optimal circuit and its weight.



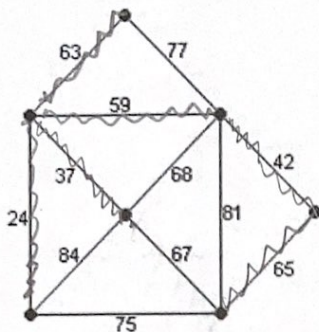
CSBC

$$8 + 10 + 9 + 10 = 37$$

60) True or False? A spanning tree is a subgraph that contains all of a connected graph's vertices, is connected, and contains only one circuit.

NO

61) A new office building is built, and cat-5 lines need to be run in order to connect all of the offices. Use Kruskal's algorithm to find the minimum amount of line needed.

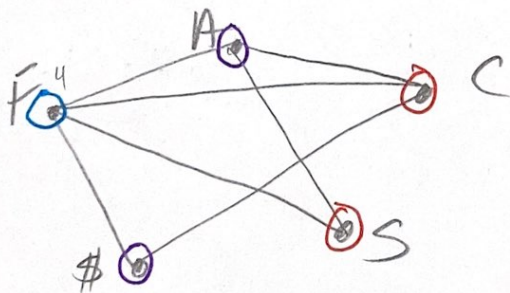


$$24 + 37 + 42 + 59 + 63 + 65 = 290$$

62) Suppose that 4 Student Leadership committees all want to meet during lunchtime.

	Fundraising	Activities	Communication	Service	Accounting
Amy	X		X		X
Heather	X	X		X	
Sara			X		X
Amber	X	X	X		

What is the least number of days required for all committees to meet without out any scheduling conflicts?



3 days

63) Express each expanded form as a Hindu-Arabic numeral:

$$(9 \times 10^6) + (0 \times 10^5) + (1 \times 10^4) + (5 \times 10^3) + (5 \times 10^2) + (7 \times 10^1) + (4 \times 1)$$

9,015,574

64) If the Babylonian numeral V stands for 1 and the Babylonian numeral < stands for 10, then write the Babylonian numeral as a Hindu-Arabic numeral:

<<VV <VVV <<VVVV

$27 \cdot 60^2$ $13 \cdot 60^1$ $24 \cdot 1$

80,004

65) Use the table to write the Mayan number as a Hindu-Arabic numeral.

== 12,7200

.... 19,360

== 10,20

.... 14,1

93454

0	1	2	3	4
	•	••	•••	••••
5	•	••	•••	••••
10	•	••	•••	••••
15	•	••	•••	••••
16	•	••	•••	••••
17	•	••	•••	••••
18	•	••	•••	••••
19	•	••	•••	••••

66) Convert the number to base ten: 4502_{nine}

$4 \cdot 9^3 + 5 \cdot 9^2 + 0 \cdot 9^1 + 2 \cdot 1$

3,323

67) Convert the number to base ten: 21543_{seven}

$2 \cdot 7^4 + 1 \cdot 7^3 + 5 \cdot 7^2 + 4 \cdot 7^1 + 3 \cdot 1 = 5421$

68) Convert the base ten numeral 119 to base two.

$64 \overline{) 119} \quad 32 \overline{) 55} \quad 16 \overline{) 23} \quad 8 \overline{) 7} \quad 4 \overline{) 3} \quad 2 \overline{) 1}$

$2^6 \quad 2^5 \quad 2^4 \quad 2^3 \quad 2^2 \quad 2^1 \quad 1$
64 32 16 8 4

69) Add in the indicated base:

$\begin{array}{r} 5432_{\text{six}} \\ + 452_{\text{six}} \\ \hline 10324_{\text{six}} \end{array}$

$8 = 12$

$9 = 13$

1110111_{two}

70) Multiply in the indicated base: 32_{four}

$\begin{array}{r} 32_{\text{four}} \\ \times 3_{\text{four}} \\ \hline 222_{\text{four}} \end{array}$

$6 = 12$

$10 = 22$