Math102 Mathematical Concepts II – Spring 2008 – DLA – PreTest 2

Name SOLUTIONS!

Each of the 19 questions is worth 5 points plus 1 points for each of 5 homework problems for a total of 100

Evaluate the expression.

1) $(5 - 6) - (-10 + 11)$

$5 - 6 + 10 - 11$

$\boxed{-2}$

2) $[(-2)(-2)] \cdot [9(-9)]$

$4 \cdot -81$

$\boxed{-324}$

Express the terminating decimal number as a quotient of two integers.

3) 6.05

$\frac{605}{100}$

$\boxed{\frac{121}{20}}$

Express the repeating decimal number as a quotient of two integers.

4) 0.585858 . . .

$100N = 58.585858\ldots$

$N = 0.585858\ldots$

$100N - N = 58$

$99N = 58$

$N = \boxed{\frac{58}{99}}$

Decide if the number is rational or irrational.

5) $-\sqrt{169}$

$-13 =$ RATIONAL

State the name of the property illustrated.

6) $(1 \cdot 3) \cdot 9 = 1 \cdot (3 \cdot 9)$

ASSOCIATIVE

Use the distributive property to multiply. Then, if possible, simplify the resulting expression.

7) $3(x + 4)$

$3x+12$

Evaluate.

8) $(x + 3y)^2$ for $x = 4, y = 3$

$$[4 + 3(4)]^2$$
$$(4+9)^2$$
$$(13)^2$$
$$\boxed{169}$$

Combine like terms.

9) $12x - 6y + 7 - 8x - 2 - 4y$

$$12x - 8x - 6y - 4y + 7 - 2$$
$$\boxed{4x - 10y + 5}$$

Solve the equation.

10) $4(5x - 1) = 16$

$$20x - 4 = 16$$
$$20x = 20$$
$$x = \frac{20}{20} = \boxed{1}$$

Translate the statement into a mathematical equation.

11) 5 times a number added to 8 times the number equals 16.

$5x + 8x = 16$

Solve the problem.

12) A baseball team played 177 complete games last season. They had 33 fewer wins than losses. How many games did the team win?

$w = \#$ wins $L = \#$ losses

$w = L - 33$

$L = w + 33$

$w + L = 177$

$w + (w+33) = 177$

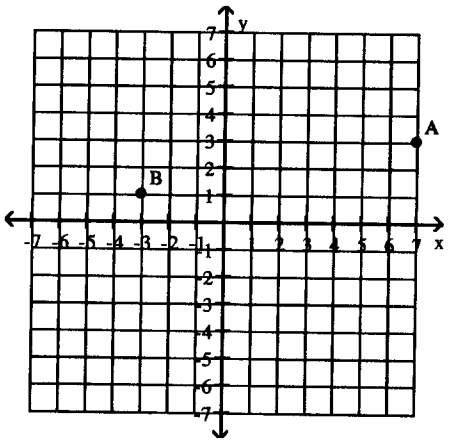
$2w + 33 = 177$

$2w = 144$

$w = \frac{144}{2} =$ 72 games

Give the coordinates of the points shown on the graph.

13)

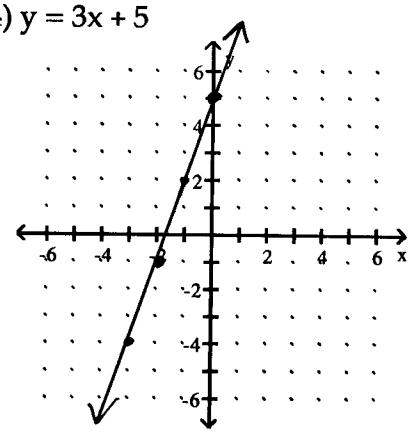


$A = (7, 3)$

$B = (-3, 1)$

Graph the equation.

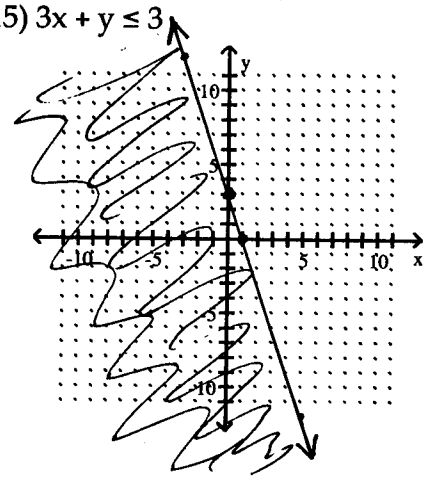
14) $y = 3x + 5$



x	y
0	5
$-\frac{5}{3}$	0
-1	2
-2	-1
-3	-4

Graph the linear inequality.

15) $3x + y \leq 3$



x	y
0	3
1	0
-3	12
5	-12

BOUNDARY LINE IS SOLID.

IF $x=0$ & $y=0$

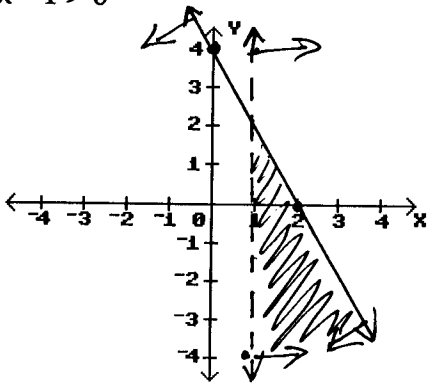
$3x+y$ IS ≤ 3

SO POINTS ON THE LEFT OF THE LINE ARE INCLUDED.

Graph the system of linear inequalities.

16) $2x + y \leq 4$ #1

$x - 1 > 0$ #2



#1 BOUNDARY IS SOLID

x	y
0	4
2	0

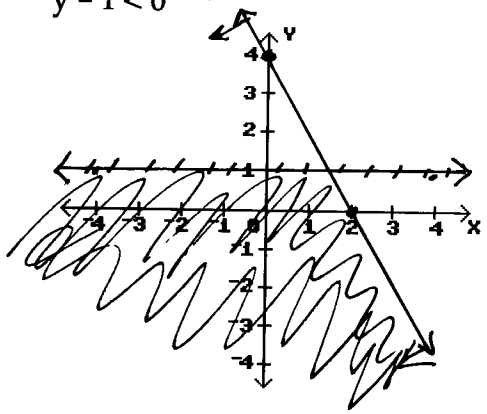
(0,0) MAKES #1 TRUE SO POINTS ON LEFT ARE INCLUDED

#2 BOUNDARY IS DASHED

x	y
1	-4
1	+4

(0,0) MAKES #2 FALSE SO POINTS ON RIGHT ARE INCLUDED

17) $2x + y \le 4$ #1
$y - 1 < 0$ #2



#1 BOUNDARY IS SOLID

x	y
0	4
2	0

(0,0) MAKES #1 TRUE SO POINTS ON LEFT ARE INCLUDED

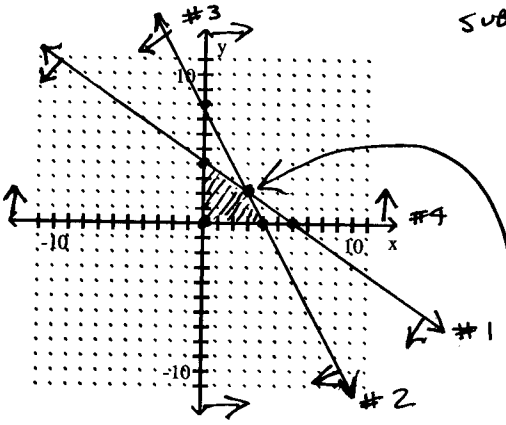
#2 BOUNDARY IS DASHED

x	y
-9	1
4	1

(0,0) MAKES #2 TRUE SO POINTS BELOW ARE INCLUDED

Use graphical methods to solve the linear programming problem.

18) $2x + 3y \le 12$ #1
$2x + y \le 8$ #2
$x \ge 0$ #3
$y \ge 0$ #4
Maximize $P = 6x + 7y$



#1

x	y
0	4
6	0

#2

x	y
0	8
4	0

SUBTRACT #2 FROM #1
$2x + 3y = 12$
$2x + y = 8$
$2y = 4$
$y = 2$
SUB $y=2$ INTO #2
$2x + 2 = 8$
$2x = 6$
$x = 3$
SO THIS POINT IS (3,2)

$P = 6x + 7y$

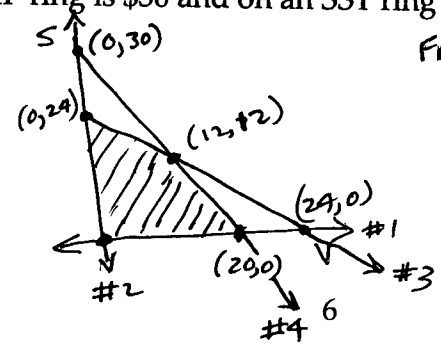
x	y	P
0	0	0
4	0	24
3	2	(32)
0	4	28

MAX $P = 32$ OCCURS AT $x = 3, y = 2$

The Acme Class Ring Company designs and sells two types of rings: the VIP and the SST. They can produce up to 24 rings each day using up to 60 total man-hours of labor. It takes 3 man-hours to make one VIP ring, versus 2 man-hours to make one SST ring.

19) How many of each type of ring should be made daily to maximize the company's profit, if the profit on a VIP ring is $30 and on an SST ring is $40?

#1 $S \ge 0$
#2 $V \ge 0$
#3 $S + V \le 24$
#4 $2S + 3V \le 60$



FROM #3 $S = 24 - V$. SUB THIS INTO #4
$2(24 - V) + 3V = 60$
$48 - 2V + 3V = 60$
$V = 12$ SUB THIS INTO #3
$S + 12 = 24$
$S = 12$ SO INTERSECTION IS (12,12)

$P = 30V + 40S$

V	S	P
20	0	600
12	12	840
0	24	(960)

SO MAX $P = \$960$ WHEN NO VIP & 24 SST RING ARE PRODUCED.