Math 100 Unit 3 Test Name:_____

1. Simplify the following expression as much as possible and answer the questions below:
$2(5a-2)+3(a^2+4)$

$10a-4+3a^2+12$

$10a+8+3a^2$

a. Write your answer as a polynomial in standard form.

½ $3a^2+10a+8$

b. Is your answer to (a) a monomial, binomial or trinomial?

½ trinomial

2. Solve: $[2(2-4)+15]\cdot 3+2=$

½ $[2(-2)+15]\cdot 3+2=$

$[-4+15]\cdot 3+2=$

$11\cdot 3+2=$

$33+2=$

35

3. To calculate Body Mass Index (BMI) use the formula $BMI=\frac{W}{H^2}$ where W is the weight in kilograms and H is the height in meters. Calculate the BMI of someone who is 2m tall and weighs 90 kilograms.

½ $BMI=\frac{90kg}{(2m)^2}=\frac{90kg}{4m^2}=22.5\frac{kg}{m^2}$

1/8

4. Evaluate each expression with the given values: a=$\frac{1}{2}$, $b = 3.4$, $c = -11$

a. $2a+3 =$

1/2 $2\left(\frac{1}{2}\right)+3 = 1+3 = 4$

b. $a+b =$

1/2 $\frac{1}{2} + 3.4 = 0.5 + 3.4 = 3.9$

c. $(-a)^2 =$

1/2 $\left(-\frac{1}{2}\right)^2 = \frac{1}{4}$

d. $b^2 =$ $(3.4)^2 =$ 34 × 34 = 136 + 1020 = 11.56

1/2

e. $\frac{c-1}{1-c} =$

1/2 $\frac{-11-1}{1-(-11)} = \frac{-12}{12} = -1$

f. $187 \div b =$

1/2 3.4)187.0 = 55. ; 170 ; 170

g. $\frac{c}{2} + \frac{c}{22} =$

1/2 $\frac{-11 \cdot 11}{2 \cdot 11} + \frac{-11}{22} = \frac{-121 - 11}{22} = \frac{-132}{22} = -6$

h. $-c(1+c) =$

1/2 $-(-11)(1+(-11)) = 11(-10) = -110$

$-c - c^2 = -(-11) - (-11)^2$

$= 11 - 121$

$= -110$

7/16

5. Solve each equation. Remember that you can check your answer by substituting your solution into the original equation and simplifying each side of the equation:

a. $a+\sqrt{49}=100$

$a+7=100$

$a=93$ 1/2

b. $b-|6-2|=-4$

$b-|4|=-4$

$b-4=-4$ 1/2

$b=0$

c. $3c^2=243$

$c^2=81$

$c=\pm 9$ 1/2

d. $\frac{d}{6}=\frac{3}{2}$

$d=\frac{3\cdot 6}{2}=3\cdot 3=9$ 1/2

e. $\frac{e}{4}+5e=45$

$\frac{e}{4}+\frac{5e}{1}\cdot\frac{4}{4}=45$

$e+20e=45\cdot 4$ 1/2

$21e=180$

$e=\frac{180}{21}=\frac{60}{7}$

10

f. $f - \frac{1}{6} = 3\frac{1}{9}$

$f = 3\frac{1}{9} + \frac{1}{6}$

1/2 $f = \frac{28}{9 \cdot 2} + \frac{1 \cdot 3}{6 \cdot 3} = \frac{56 + 3}{18} = \frac{59}{18}$

g. $-2g - 10 = -30$

$-2g = -20$

1/2 $g = 10$

h. $5(h + 2) + 4h = 11h$

$5h + 10 + 4h = 11h$

1/2 $10 = 2h$

$h = 5$

i. $-5(i - 10) = 5i + 10$

$-5i + 50 = 5i + 10$

1/2 $40 = 10i$

$i = 4$

j. $\frac{14}{x} + \frac{1}{x} + (2 \bullet 5) = 15$

$\frac{15}{x} = 5$

1/2

$x = 3$

/10

6. $4x - 7 < -3$

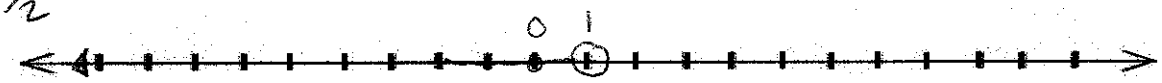
a. Solve the inequality.

$4x < 4 \qquad x < 1$

1/2

b. Graph the solution on the number line.

1/2



7. $8x + 5 \geq 53$

a. Solve the inequality.

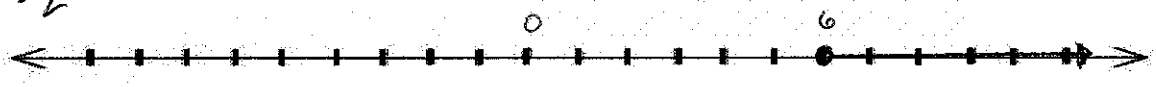
1/2

$8x \geq 48$

$x \geq 6$

b. Graph the solution on the number line.

1/2



8. $4 - 4a \leq 32$

a. Solve the inequality.

1/2

$-4a \leq 28 \qquad -28 \leq 4a$

$a \geq -7 \qquad -7 \leq a$

b. Graph the solution on the number line.

1/2

12

9. Write an equation with variables to represent each unknown value:

a. The area of a parallelogram (A) is equal to the product of the base (B) and the height (H).

½ $A = B \cdot H$

b. The difference between the original price and the sale price is the discount.

$O - S = D$ ½

c. Shlomo's speed (S) is 10 miles per hour faster than Yitzi's speed (Y).

½ $S = Y + 10$

10.

a. Write an equation to represent the following information: A bag of 240 jellybeans is divided equally among three children. Each child gets x jellybeans.

½ $\frac{240}{3} = x$

b. Solve the equation to determine how many jelly beans each child gets.

½ $x = 80$

11.

a. Write an equation to represent the following information: There are five boxes, each with x chocolates. Sarah pours them into a bowl and adds another 10 chocolates. Now there are 70 chocolates in all.

½ $5x + 10 = 70$

b. Solve the equation to determine how many chocolates were in each box.

½ $5x = 60$

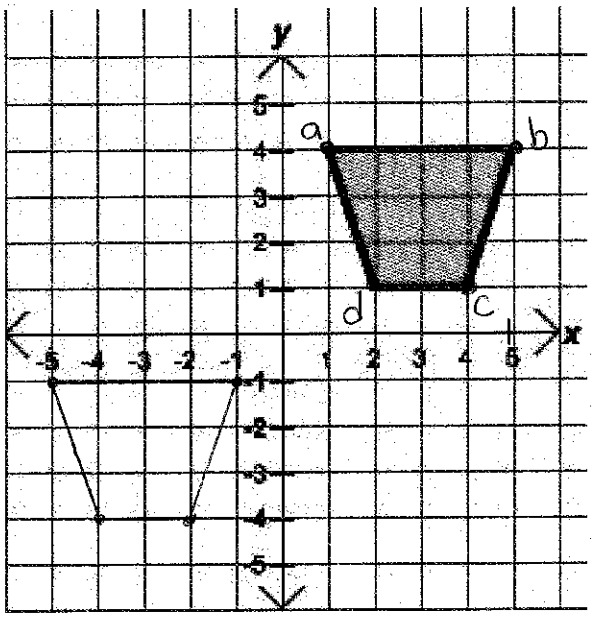
$x = 12$

14

12. Consider the figure plotted on the graph below. Label and give the coordinates of each vertex.

a. (1, 4)
b. (5, 4)
c. (4, 1)
d. (2, 1)

/4



13. If the figure is reflected in the y-axis AND translated 5 units down determine the new coordinates of each point. $-x$ $y-5$

a. (-1, -1)
b. (-5, -1)
c. (-4, -4)
d. (-2, -4)

/8

/12

14. Shifra works in sales. She makes $200 a week plus 10% of whatever she sells. Her wages can be represented by the function $W = 200 + 0.10S$ where W represents her wages in dollars and S represents the dollar amount of sales she makes.

a. Complete the table below for this function.

S	W
0	200
100	210
200	220
1000	300
2000	400

$W = 200 + 0.10(100) = 200 + 10 = 210$

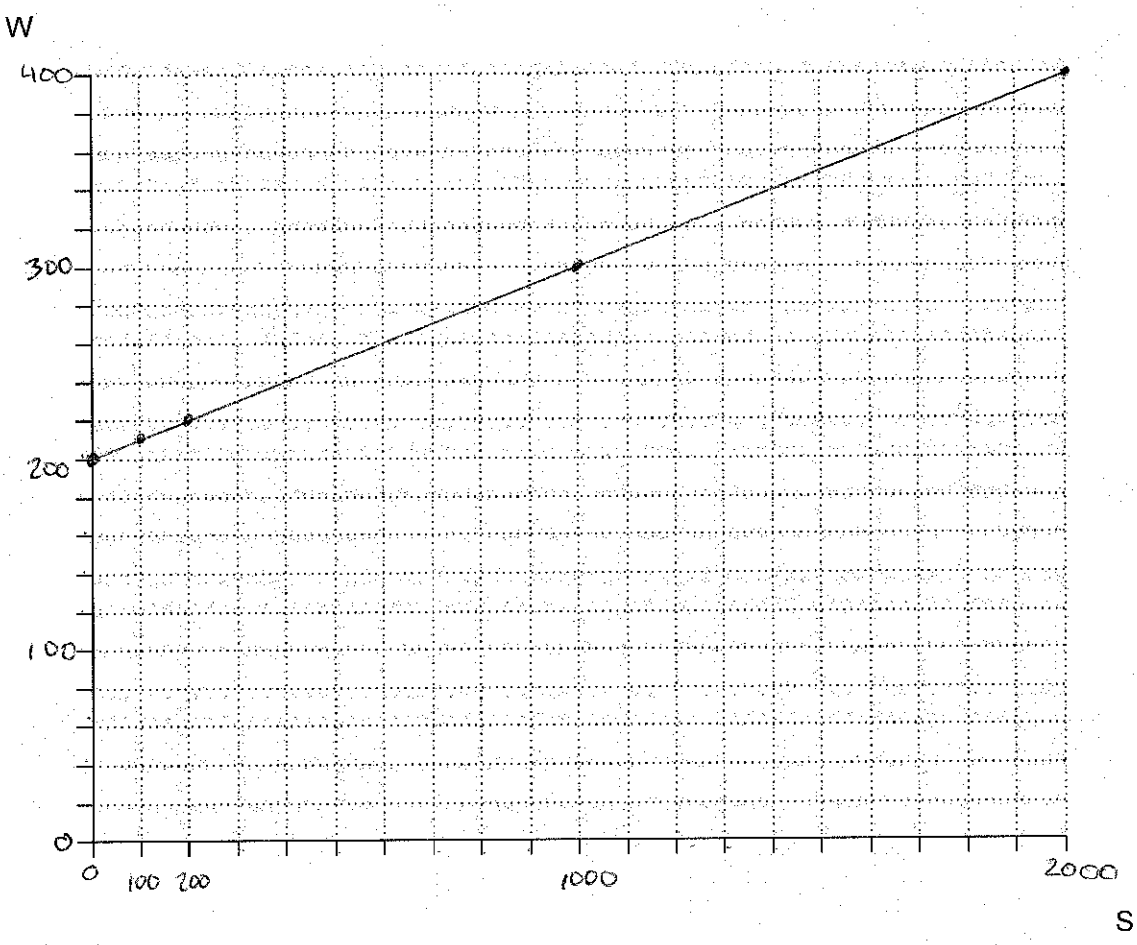
$W = 200 + 0.10(200) = 200 + 20 = 220$

$300 = 200 + 0.10S \rightarrow 100 = 0.10S \rightarrow S = 1000$

$400 = 200 + 0.10S \rightarrow 200 = 0.10S \rightarrow S = 2000$

/8

b. Plot the function on the graph below.



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Read the graph ***carefully*** and answer the questions.

15. How many bears were there in Emerald Forest in 2001?

50,000

½

16. By how much did the bear population increase (+) or decrease (-) between 2000 and 2006?

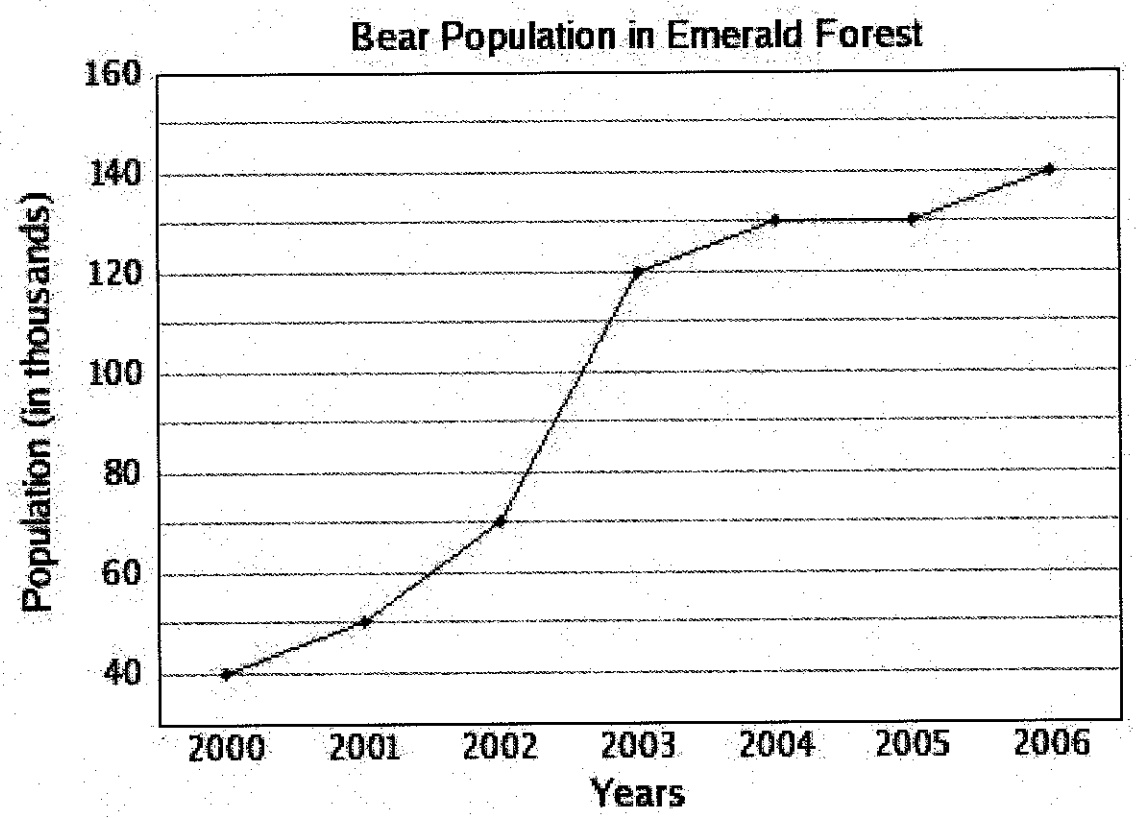
+100,000

½

17. During which interval was there the greatest amount of change?

2002-2003

1



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12

Bonus: Compute the square of one hundred eleven million, one hundred eleven thousand, one hundred eleven.