Test 1 – MAT1033/MAC1105 Name Key

Calculator part. You may use your calculator on this part of the test. Show all necessary work for full credit.

2 1. Simplify: $\frac{6-8\div 4}{2+(-3)}+\frac{6+2^4}{3-(-1)}$

$\frac{6-2}{-1}+\frac{6+16}{4}=-4+\frac{22}{4}=1.5=\frac{3}{2}$

2. Simplify and write your answer as a decimal with 2 decimal places: $\frac{6+\sqrt{(-6)^2-4(3)(2)}}{4(3)}$

2 $\frac{6+\sqrt{36-24}}{12}=.79$

3. The amount of gasoline (in gallons) left in the tank of a car after traveling m miles can be approximated by the formula $G = 16 - \frac{1}{28}m$.

A. How much gasoline is left in the tank of the car after traveling 150 miles?

2 $G=16-\frac{1}{28}(150)=10.64$ gal

B. How many miles can the car travel before there is 3 gallons of gasoline left in the tank?

3 $3=16-\frac{1}{28}m$

$\frac{1}{28}m=13$ $m=364$ miles

4. Given $2x - 4y = 8$:

A. Find the x-intercept.

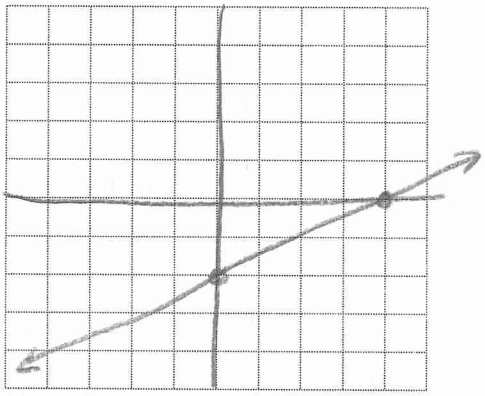
2 $(4,0)$

B. Find the y-intercept.

2 $(0,-2)$

C. Sketch the graph.

3



5. Jim works for a car dealership. He makes a flat amount of $100 per week plus 3% of his sales for the week. Write an equation for the amount of money Jim makes in terms of his sales.

3 $m=100+.03s$

6. The temperature in the desert at 6 am was 65°F. The temperature rose 6 degrees every hour until it reached its maximum value at 4 pm.

A. Complete the table of values for the temperature, T, at h hours after 6 am. 3

hours, h	temperature, T
0	65
5	95
8	113

B. Find an equation for the temperature, T, in terms of hours, h, since 6am. 3

$T = 65 + 6h$

C. When will the temperature be 90°F? 3

$90 = 65 + 6h$

$25 = 6h$

$h = \frac{25}{6} = 4.17$

10 am

D. Give an appropriate viewing window. 3

xmin = 0 ymin = 50

xmax = 10 ymax = 120

xscl = 1 yscl = 10

7. Solve the equation using a table: $\frac{1}{4}(x+1) = \frac{1}{2}(2x+5) - 6$ 4

Fill in the table below and use it to solve the equation. Write your answer in interval notation.

x	-1	1	3	5	7
$\frac{1}{4}(x+1)$	0	.5	1	1.5	2
$\frac{1}{2}(2x+5)-6$	-4.5	-2.5	-.5	1.5	3.5

Solution: $x = 5$

8. Peggy buys a 40-pound bag of rice and consumes 1.5 pounds per week.

A. Write an expression for the amount of rice that Peggy has left in terms of the number of weeks since she has bought the bag. 3

$R = 40 - 1.5w$

B. Find the vertical intercept and explain what it means in the context of this problem. 4

(0, 40) She starts with 40 lbs.

Test 1 – MAT1033/MAC1105 Name Key

No calculator part. You may not use your calculator on this part of the test. Show all necessary work for full credit.

3 1. Simplify the following:

$\sqrt{49} - 3(2) + 2(1-4)^2$

$7 - 6 + 2(9) = 19$

2 2. Write 0.000591 in scientific notation. 5.91×10^{-4}

2 3. Write 3.7×10^5 in standard notation. 370,000

3 4. Solve $4y + 3(2y - 7) = 5 - 11y$

$4y + 6y - 21 = 5 - 11y$

$10y - 21 = 5 - 11y$

$21y = 26$

$y = \frac{26}{21}$

2 5. Use the table to solve the inequality $0.5(3x-1) > 4$. Explain or indicate on the table how you found your solution for full credit.

$(3, \infty)$

$x > 3$

X	Y1
-1	-2
0	-.5
1	1
2	2.5
3	4
4	5.5
5	7

$Y_1 = 0.5(3X-1)$

3 6. A. Solve the inequality: $-3x + 6 \geq -9$

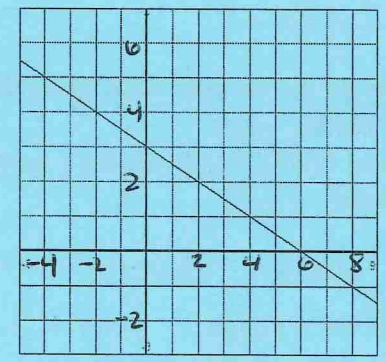
$-3x \geq -15$

$x \leq 5$

1 B. Write the solution in interval notation. $(-\infty, 5]$

4 7. Use the graph to fill in the missing table values. Assume the scales are 1 unit.

x	y
0	3
6	0
-2	4
8	-1



8. Given $f(x) = 6x - 1$ and $g(x) = x + 7$, find:

3 A. $(f - g)(x) = 5x - 8$

3 B. $(fg)(4) = (23)(11) = 253$

3 C. $(f \circ g)(x) = 6(x+7) - 1 = 6x + 41$

9. Is temperature in Celsius a function of temperature in Fahrenheit? Why or why not?

3 yes, each Fahrenheit temp has one Celsius temp

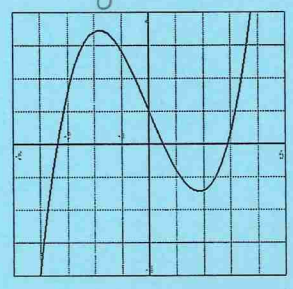
10. Is Adjusted Gross Income a function of Tax Bracket? Why or why not?

3 No, each tax bracket has multiple incomes

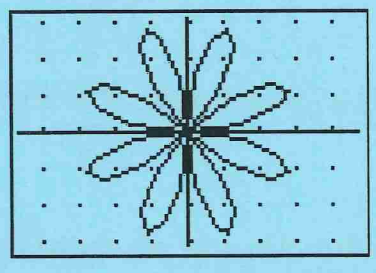
Tax Bracket (T)	Adjusted Gross Income (I)
0%	\$0-2479
11%	\$2480-3669
12%	\$3670-4749
14%	\$4750-7009
15%	\$7010-9169

4 11. Are the following graphs of functions?

A. yes



B. no



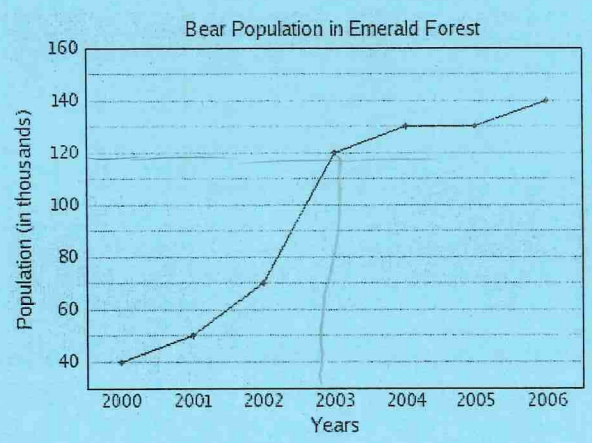
12. The graph shows the bear population in Emerald Forest for certain years.

4 A. Estimate P(2002) and explain what this means in context. 70

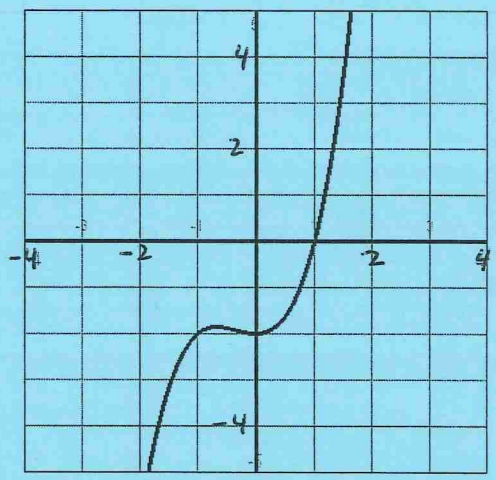
In 2002, there were 70 thousand bears.

2 B. During which years was the population **above** 120 thousand bears?

after 2003



13. Use the graph of f(t) shown to approximate the following.



2 A. What is the horizontal intercept? (1, 0)

2 B. What is the vertical intercept? (0, -2)

14. Given the table:

A, years	H(A), inches
2	22
5	40
12	58
17	64
22	66
30	66

2 A. Find H(22). 66

3 B. What is an appropriate viewing window for this data?

xmin = 0 xmax = 30 xscl = 5

ymin = 0 ymax = 70 yscl = 10

15. Given $F(t) = \frac{3t+1}{t+4}$, find:

3 A. F(2) = $\frac{7}{6}$

3 B. F(n - 1) = $\frac{3n-2}{n+3}$ $\frac{3(n-1)+1}{n-1+4}$

42

Test 1 – MAT1033/MAC1105 Name Key

Calculator part. You may use your calculator on this part of the test. Show all necessary work for full credit.

1. Simplify: $\frac{6-8\div 2}{2+(-3)}+\frac{10+2^4}{3-(-1)}$

2

$\frac{6-4}{-1}+\frac{10+16}{4}=-2+\frac{26}{4}=4.5=\frac{9}{2}$

2. Simplify and write your answer as a decimal with 2 decimal places: $\frac{9+\sqrt{(-9)^2-4(5)(3)}}{4(5)}$

2

$\frac{9+\sqrt{81-60}}{20}=.68$

3. The amount of gasoline (in gallons) left in the tank of a car after traveling m miles can be approximated by the formula $G = 16 - \frac{1}{28}m$.

A. How much gasoline is left in the tank of the car after traveling 220 miles?

2

$G=16-\frac{1}{28}(220)=8.14$ gal

B. How many miles can the car travel before there is 5 gallons of gasoline left in the tank?

3

$5=16-\frac{1}{28}m \quad -11=-\frac{1}{28}m \quad m=308$ miles

4. Given $4x - 2y = -8$:

A. Find the x-intercept.

2

(-2,0)

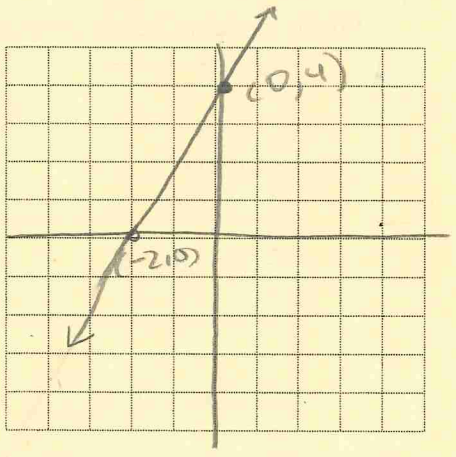
B. Find the y-intercept.

2

(0,4)

C. Sketch the graph.

3



5. Jim works for a car dealership. He makes a flat amount of $225 per week plus 2% of his sales for the week. Write an equation for the amount of money Jim makes in terms of his sales.

3

$m=225+.02s$

6. The temperature in the desert at 7 am was 68°F. The temperature rose 6 degrees every hour until it reached its maximum value at 5 pm.

A. Complete the table of values for the temperature, T, at h hours after 7 am.

3

hours, h	temperature, T
0	68
5	98
8	116

B. Find an equation for the temperature, T, in terms of hours, h, since 7 am.

3

$T = 68 + 6h$

C. When will the temperature be 80°F?

3

$80 = 68 + 6h$ $h = 2$ 9am

$12 = 6h$

D. Give an appropriate viewing window.

3 xmin = 0 ymin = 60

xmax = 10 ymax = 120

xscl = 1 yscl = 10

7. Solve the equation using a table: $\frac{1}{4}(x+1) = \frac{1}{2}(2x+5) - 6$

Fill in the table below and use it to solve the equation. ~~Write your answer in interval notation~~.

4

x	-1	1	3	5	7
$\frac{1}{4}(x+1)$	0	.5	1	1.5	2
$\frac{1}{2}(2x+5)-6$	-4.5	-2.5	-.5	1.5	3.5

Solution: $x = 5$

8. Peggy buys a 35-pound bag of rice and consumes 1.25 pounds per week.

3 A. Write an expression for the amount of rice that Peggy has left in terms of the number of weeks since she has bought the bag.

$R = 35 - 1.25w$

4 B. Find the vertical intercept and explain what it means in the context of this problem.

(0, 35) She starts with 35 pounds

25

60

Test 1 – MAT1033/MAC1105 Name Key

No calculator part. You may not use your calculator on this part of the test. Show all necessary work for full credit.

1. Simplify the following:

3 $2(1-4)^2+\sqrt{81}-3(5)$

$2(9)+9-15=12$

2. Write 4,800,000 in scientific notation. 4.8×10^{6}

2 3. Write 3.7×10^{-5} in standard notation. .000037

3 4. Solve $5m + 3(2m - 7) = 4 - 9m$

$5m+6m-21=4-9m$

$11m-21=4-9m$

$20m=25$

$m=\frac{25}{20}=\frac{5}{4}$

5. Use the table to solve the inequality $0.5(3x-1) < 5.5$. Explain or indicate on the table how you

2 found your solution for full credit.

$x<4$

$(-\infty,4)$

X	Y1
-1	-2
0	-.5
1	1
2	2.5
3	4
4	5.5
5	7

Y1 B.5(3X-1)

6. A. Solve the inequality: $-3x + 9 \leq -15$

3 $-3x \leq -24$

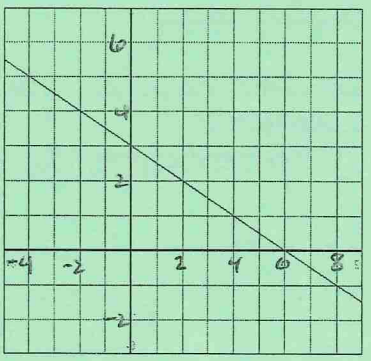
$x \geq 8$

1 B. Write the solution in interval notation. $[8, \infty)$

7. Use the graph to fill in the missing table values.

4 Assume the scales are 1 unit.

x	y
0	3
6	0
-4	5
-2	4



8. Given $f(x) = 4x + 1$ and $g(x) = 2x - 7$, find:

3 A. $(f - g)(x)$ $= 2x + 8$

3 B. $(fg)(4)$ $= (17)(1) = 17$

3 C. $(f \circ g)(x)$ $4(2x-7)+1 = 8x - 27$

9. Is temperature in Fahrenheit a function of temperature in Celsius? Why or why not?

3 Yes, each Celsius temp has one Fahrenheit temp

10. Is Adjusted Gross Income a function of Tax Bracket? Why or why not?

3 No, each tax bracket has multiple incomes

Tax Bracket (T)	Adjusted Gross Income (I)
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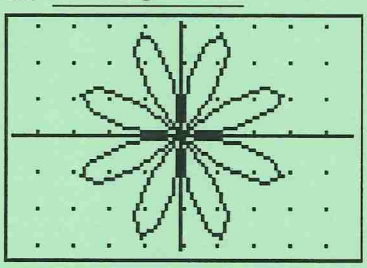
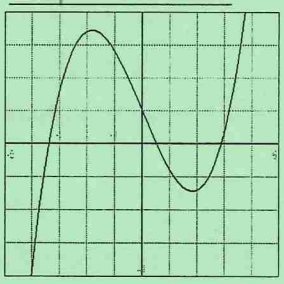
11. Are the following graphs of functions?

4 A. No



B. Yes



12. The graph shows the bear population in Emerald Forest for certain years.

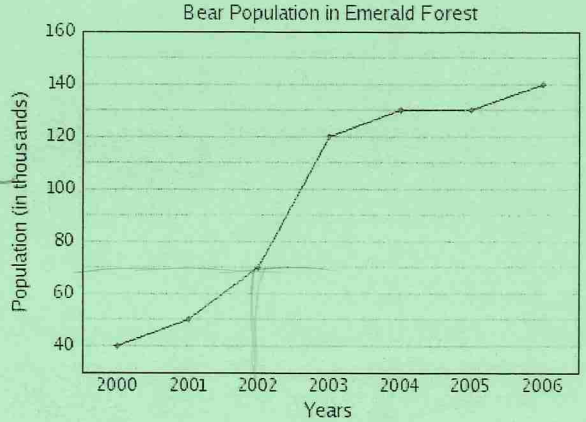
4 A. Estimate P(2003) and explain what this means in context.

P(2003) = 120

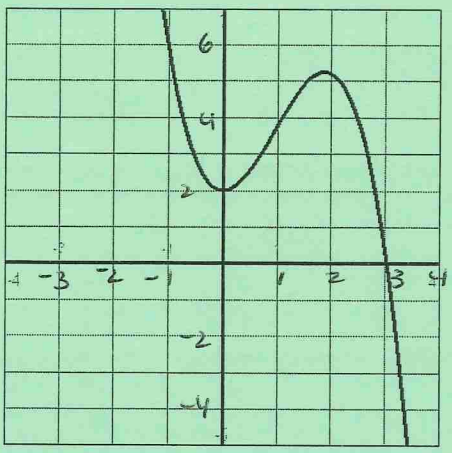
In 2003, the bear population was 120 thousand.

2 B. During which years was the population **below** 70 thousand bears?

before 2002



13. Use the graph of f(t) shown to approximate the following.



2 A. What is the horizontal intercept? (3, 0)

2 B. What is the vertical intercept? (0, 2)

14. Given the table:

A, years	H(A), inches
2	12
5	30
12	48
17	54
22	62
30	62

2 A. Find H(12). 48

3 B. What is an appropriate viewing window for this data?

xmin = 0 xmax = 30 xscl = 5

ymin = 0 ymax = 65 yscl = 10

15. Given $F(x) = \frac{3x+1}{x+4}$, find:

3 A. F(3) = $\frac{10}{7}$

3 B. F(t - 1) = $\frac{3t-2}{t+3}$ $\frac{3(t-1)+1}{t-1+4}$