

Using Technology to Tame the EOC

Written by Kim Clark

Presented by:

Kim Clark (kimclark@waynecc.edu)

And

Katina Phillips (Phillips@waynecc.edu)

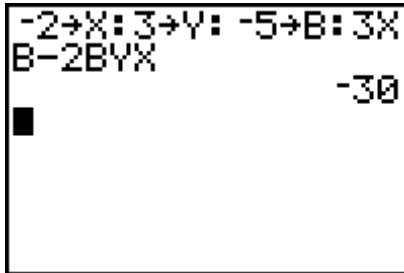
Wayne Community College
3000 Wayne Memorial Drive
Goldsboro, N.C. 27533-8002
(919) 735-5152 ext. 324 or ext. 708

Permission is granted to copy and incorporate these activities into your classroom.

The following are some examples of strategies that may be used on the End Of Course Tests. These strategies do not replace instruction but may be helpful in your test review.

Evaluate an expression

To evaluate an expression students may use the STO option on their calculator. Evaluate $3xb - 2byx$ if $x = -2$, $y = 3$, and $b = -5$.



Equation of a line

To see if an ordered pair is a solution to an equation (or lies on the line) students may evaluate as shown above or put the equation into $y =$ and then use table or trace.

Ex. The graph of which ordered pair lies on the line $2y = 3x - 2$?

- (5,3)
- (-3,4)
- (4,5)
- (1,-7)

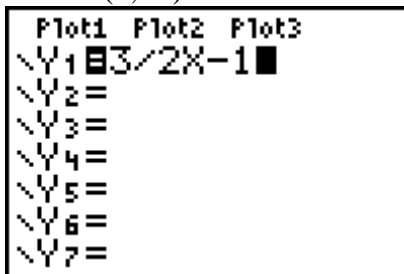
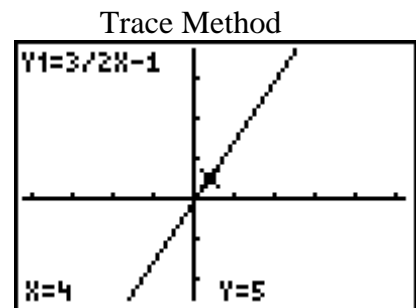


Table Method

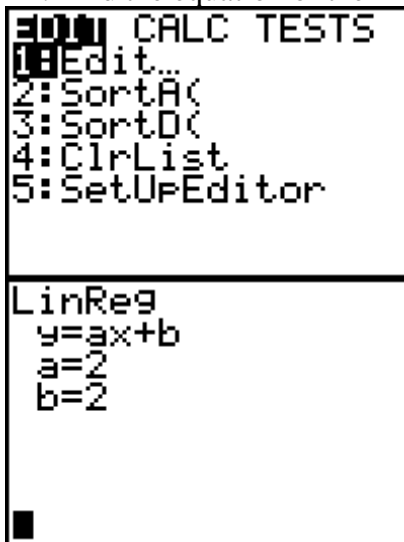
X	Y1
0	-1
1	0.5
2	2
3	3.5
4	5
5	6.5
6	8

X=4



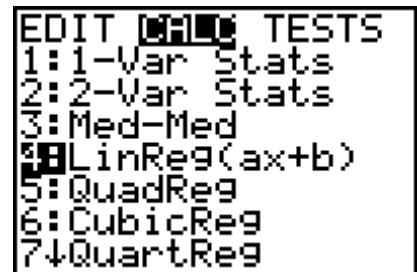
To find the equation of a line through two points, do regression with the two points. Begin by selecting STAT.

Ex. Find the equation of the line through (2,6) and (1,4).



L1	L2	L3	Σ
2	6	0	
1	4	0	
-----	-----	0	
		0	
		0	
		0	
		0	
		0	

L2(3) =



Equation of line continued

To find the equation of a line given slope and a point, use slope to get another point and go back to previous strategy.

Ex. Find the equation of a line with slope $\frac{2}{3}$ and through $(-3,1)$.

Use the points $(-3,1)$ and $(-3+3,1+2)$

To get slope given two points

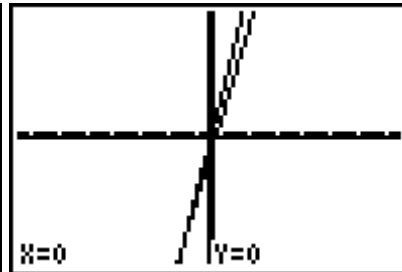
Enter the two points under Stat and then do a linear regression. This method reinforces the fact that the slope of the line is the x coefficient when the equation is in slope intercept form.

To solve equations

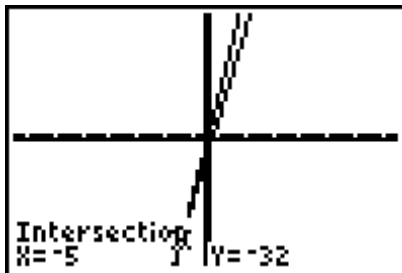
Ex. Solve $2(3x - 1) = 5x - 7$

Type left side into Y1 and right side into Y2. Zoom to see intersection and then use 2nd, Trace, Intersection

```
Plot1 Plot2 Plot3
Y1=2(3X-1)
Y2=5X-7
Y3=
Y4=
Y5=
Y6=
Y7=
```



```
CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```



Solve Systems

One strategy is to solve each equation for y, put one equation into Y1 and the other into Y2, then use intersection.

Another strategy is matrices. Students get very quick at this with practice and it works for systems of more than 2. Screens are shown for the sample problem. Begin by selecting MATRX.

Ex. Solve $2x - 2y = 6$

$4x + y = 4$

```
NAMES MATH EDIT
1:[A]
2:[B]
3:[C]
4:[D]
5:[E]
6:[F]
7↓[G]
```

```
NAMES MATH EDIT
1:[A]
2:[B]
3:[C]
4:[D]
5:[E]
6:[F]
7↓[G]
```

```
MATRIX[A] 2 x2
[ 2  -2 ]
[ 4   1 ]
z,z=1
```

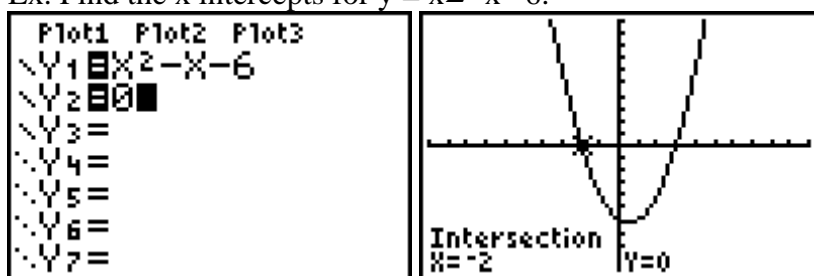
NAMES MATH EQ 1: [A] 2x2 2: [B] 3: [C] 4: [D] 5: [E] 6: [F] 7↓ [G]	MATRIX[B] 2 x1 [6 [4 2, 1=4	[A] ⁻¹ [B] [[1.4] [-1.6]]
--	--	---

The last screen is obtained by pulling the names from matrix, name, enter.

Intercepts

Getting x intercepts can often be difficult for students because they have trouble with the left and right boundaries. This can be overcome by setting the equation = 0 and then the typing equation in Y1 and 0 in Y2. Student can then use the intersection option.

Ex. Find the x intercepts for $y = x^2 - x - 6$.



Y intercepts can be found by Trace, 0, enter.

Composition of functions

Ex. If $f(x) = 2x$ and $g(x) = 3x - 1$ find $g(f(3))$.

Type $Y1 = 2x$ and $Y2 = 3x - 1$. Then enter, on the home screen, $Y2(Y1(3))$ as shown. You will start by selecting VARS.

Plot1 Plot2 Plot3 \Y1 $2X$ \Y2 $3X - 1$ \Y3 = \Y4 = \Y5 = \Y6 = \Y7 =	VARS Y-VARS 1: Window... 2: Zoom... 3: GDB... 4: Picture... 5: Statistics... 6: Table... 7: String...	VARS Y-VARS 1: Function... 2: Parametric... 3: Polar... 4: On/Off...
FUNCTION 1: Y1 2: Y2 3: Y3 4: Y4 5: Y5 6: Y6 7↓ Y7	$Y2($	$Y2(Y1(3))$ 17

Working multiple choice backwards

One option for this is typing the problem in Y1 and answers, one at a time, in Y2, and then checking for a match. This works well when checking work throughout the year. If you will make the graph from Y2 a darker line it will be easier to see if the lines match.

Ex. Simplify $(2\sqrt{3} + \sqrt{5})(3\sqrt{3} - 2\sqrt{5})$

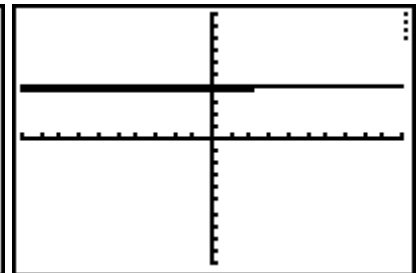
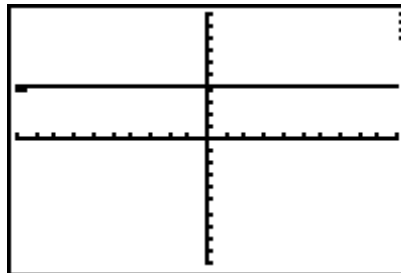
A. $8 - \sqrt{15}$

B. 8

C. $5\sqrt{3} - \sqrt{5}$

D. $8 + \sqrt{15}$

```
Plot1 Plot2 Plot3
Y1=(2√(3)+√(5))(3√(3)-2√(5))
Y2=8-√(15)
Y3=
Y4=
Y5=
Y6=
```



Another option is to use Boolean operators. First store a value in the variable you plan to use. Next type the problem with one answer choice in home screen. If the calculator gives a value of 1 this indicates true, 0 indicates false. You can get = from 2nd Test.

```
(2√(3)+√(5))(3√(3)-2√(5))=8
0
(2√(3)+√(5))(3√(3)-2√(5))=8-√(15)
1
```

Sample Problems

1. Evaluate $3x^2 - 2xy - y$ for $x = -1$ and $y = 2$
 - a. -1
 - b. -3
 - c. 9
 - d. 5
 - e. -9
2. Which of the following are solutions to $2x + 3y = 6$?
 - a. $(2,1)$
 - b. $(3,1)$
 - c. $(0,2)$
 - d. $(2,2)$
3. Write the equation of a line through $(1, -12)$ and $(-3,4)$
 - a. $4x + y = 8$
 - b. $4x + y = -8$
 - c. $4x - y = -8$
 - d. $4x - y = 8$
4. Write the equation of a line through $(5,5)$ with slope $2/3$.
 - a. $2x - 3y = -5$
 - b. $y = 2/3 x - 6$
 - c. $y = 2/3 x - 5$
 - d. $y = 4$
5. Solve the following equation
 $7x - (3x + 1) = 2x + 3$
 - a. 5
 - b. 0
 - c. -1
 - d. 2
6. Solve the following system
 $x - 3y - 2z = -4$
 $y + 3z = 7$
 $z = -5$
 - a. $x = 10, y = 8, z = -5$
 - b. $x = 52, y = 22, z = -5$
 - c. $x = -38, y = -8, z = -5$
 - d. no solution
7. If $f(x) = 3x - 2$ and $g(x) = x + 2$, find $f(g(4))$.
 - a. 7
 - b. 3
 - c. 16
 - d. 5
8. For $Y = 2x^2 - x - 4$ find the x and y intercepts

- a. $x = 3.1$ and -2.3 $y = 4$
 - b. $x = -1.2$ and 1.7 $y = -4$
 - c. $x = 3.3$ and -4.1 $y = 3$
 - d. $x = 1.2$ and -1.2 $y = -3$
8. Which statement is correct?
- a. $2.3 \geq 2.34$
 - b. $0 \leq .01$
 - c. $-6 \leq -7$
 - d. $-8 \geq -5$

9. Simplify $(2 - 4x)(3 + 5x)$

- a. $6 - 2x + 20x^2$
- b. $6 + 2x - 20x^2$
- c. $6 - 2x - 20x^2$
- d. $-6 - 2x - 20x^2$

10. Simplify $\sqrt{5x}(\sqrt{15x^2})$

- a. $3x\sqrt{5x}$
- b. $3x\sqrt{15x}$
- c. $5x2\sqrt{3}$
- d. $5x\sqrt{3x}$