

Bridge to College Mathematics

Middle Level Modules

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Bridge Pilot Project

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Assumptions

The purpose of these interventions is to help students place out of remedial math courses when they start college. There are two remedial mathematics courses at Ocean County College: Math 011 and Math 012. Students who score a 76 or higher on the placement test Accuplacer are not required to take either course. Students who score between 50 and 75 are required to take one Math 012 but not Math 011, and students who score less than 50 are required to take both courses. The interventions are particularly appropriate for students who almost place into college level courses. It is assumed that students have seen the math content before; these sessions are designed to be a review and not to replace a year-long Algebra course. The interventions stress what is most important and give lots of examples of questions on the content.

The high level sessions are for students with Accuplacer scores with scores of 51 to 75, but are particularly appropriate for students with scores close to 76. The mid-level sessions are for students with scores of 40 to 50. The goal with these students is to enable them to skip the lowest remedial math course and only take the second course. Students who score exceptionally low on the Accuplacer, would probably best be served by taking a year-long Algebra course at the high school level.

The approach is to have a short series of review sessions.

Middle Level (score 40 – 50)

This review is broken down into 6 -1 hour sessions, called modules. Here are outlines of the 6 modules. This outline is meant for teachers, not for student self-study. Each topic comes with 1 or more example questions. Note that the same question can appear in different topics.

Module 1:

Strategy:

- **Read the Question**

EX: Which of the following is NOT equal to 6?

- a) $(-3)(-2)$
- b) $(2)(3)$
- c) $(-2)(3)$
- d) $(-1)(-6)$

EX: Which problem best represents $50x + 100$?

- a) For a consultation a lawyer charges \$100 per visit plus \$50 for each hour.
- b) For a consultation a lawyer charges \$50 per visit plus \$100 for each hour.
- c) For a consultation a lawyer charges \$150 per visit.
- d) For a consultation a lawyer charges \$150 per hour.

- **Understand the Question**

EX: The area of a picture with side x is x^2 , what is the area of a picture with side $x = 4$?

- a) -16
- b) -36
- c) 16
- d) 36

- **What answer would make sense**

EX: Which of the following is equivalent to $x(x - 1)$?

- a) $x^2 + 1$
- b) $x^2 - 1$
- c) $x^2 - x$
- d) $x = 1$

EX: The area of a picture with side x is x^2 , what is the area of a picture with side $x = 4$?

- e) -16
- f) -36
- g) 16
- h) 36

Missing Easy Question hurts more than missing harder question

Examples of Easy Questions

EX: If $x - 1 = 0$ what is the value of x ?

- a) 1
- b) -1
- c) 0
- d) 2

EX: Which of the following is ordered from least to greatest?

- a) -50, -100, 50, 100
- b) -50, 50, -100, 100
- c) -100, 100, -50, 50
- d) -100, -50, 50, 100

EX: Which of the following is equivalent to $-8 + 9$?

- a) $9-8$
- b) $8 + 9$
- c) $8 -9$
- d) $8 + -9$

EX: What is the value of: $|-5| + |2|$?

- a) -7
- b) -3
- c) 3
- d) 7

EX: Which of the following is NOT equal to 6?

- a) $(-3)(-2)$
- b) $(2)(3)$
- c) $(-2)(3)$
- d) $(-1)(-6)$

Examples of Harder Questions

EX: Simplify $3x(x+4) - \frac{1}{2}\left(x - \frac{1}{11}x + \frac{7}{2}\right)$

- a) $3x^3 + \frac{127}{11}x - \frac{7}{4}$
- b) $3x^2 + \frac{127}{11}x - \frac{7}{4}$
- c) $3x^2 + \frac{127}{11}x - \frac{7}{2}$
- d) $3x^2 + \frac{127}{22}x - \frac{7}{4}$

EX: Which of the following is the least?

- a) $-1/2$
- b) -0.52
- c) -2.0
- d) $-3/8$

- **Look at Choices – You Can Work Backwards**

EX: Factor $4x^2 - 9$

- a) $(2x - 3)^2$
- b) $(2x + 3)^2$
- c) $(2x + 3)(2x - 3)$
- d) $(4x + 3)(4x - 3)$

EX: If $-\frac{25}{8}x = 0$, what is the value of x ?

- a) 0
- b) 1
- c) 2
- d) 3

EX: Which of the following expressions could have been used to generate the table?

1	2	3	...	x
3	5	7		?

- a) $2x + 1$
- b) $2x$
- c) $x + 2$
- d) x

EX: If $2x + 5y = 12$ and $y = 2$, what is the value of x ?

- a) 1
- b) 2
- c) 5
- d) 6

- **No calculators**

EX: $\frac{3}{4}x + x = 7$, what is the value of x ?

- a) 4
- b) 7
- c) 16
- d) 38

- Check your answer before you go on, you can't go back.
- Consequences for choices: As stars student you do NOT get \$ if you need to be remediated
- Not a timed test

Content for Module # 1 to be covered after Test Strategies:

- *Signed numbers*

EX: Which of the following is NOT equal to 6?

- a) $(-3)(-2)$
- b) $(2)(3)$
- c) $(-2)(3)$
- d) $(-1)(-6)$

EX: What is the value of: $|-5| - |2|$?

- a) -7
- b) -3
- c) 3
- d) 7

- *Fractions*

EX: Which of the following is the least?

- a) $-1/2$
- b) -0.52
- c) $-3/8$
- d) -2.0

EX: Which integers are between $-\frac{25}{8}$ and $\frac{4}{3}$?

- a) -3, -2, -1, 0, 1
- b) -3, -2, -1, 0, 1, 2
- c) -4, -3, -2, -1, 0, 1
- d) -4, -3, -2, -1, 0, 1, 2

- ***Order of operations***

EX: Simplify $1 - 2(3 - 6) + 3$

- a) -2
- b) 1
- c) -6
- d) 10

EX: What is the value of $(-4 + 12) \div 4 - 2(5)$

- a) -8
- b) -6
- c) $-\frac{4}{5}$
- d) 20

- ***Evaluating expressions***

EX: Evaluate $4n - 5$ when $n = -2$

- a) 13
- b) 3
- c) -12
- d) -13

- ***Absolute value***

EX: Evaluate $-2|x + y|$ when $x = 2$ and $y = 4$.

- a) 12
- b) -12
- c) 4
- d) -4

- ***Ordering numbers***

EX: Which of the following is the least?

- a) $-1/2$
- b) -0.33
- c) $-.20$
- d) $-2/3$

EX: Which integers are between $-\frac{3}{2}$ and $\frac{2}{3}$?

- a) $-1, 0$
- b) $-1, 0, 1$
- c) $0, 1$
- d) 0

- ***Evaluating expressions***

EX: Evaluate $4n - 5$ when $n = -2$

- a) 13
- b) 3
- c) -12
- d) -13

- ***Combining like terms***

EX: Which of the following represents the perimeter of the rectangle with height $2x+1$ and width $3x-2$?

- a) $5x - 1$
- b) $10x - 2$
- c) 3
- d) $5x + 3$

EX: Simplify $3x + y - x^2 + 2y + 2x^2$.

- a) $3x + x^2 + 3y$
- b) $x + x^2 + 3y$
- c) $3x - x^2 + 3y$
- d) $3x + x^2 + y$

EX: Find the sum of $(h^2 + 4h - 4) + (h^3 + 5h^2 - 8h + 2)$.

- a) $6h^2 - 4h - 2$

- b) $h^3 + 6h^2 - 4h - 2$
- c) $h^3 + 6h^2 + 4h - 2$
- d) $6h^2 - 4h + 2$

EX: Find the difference of $(h^2 + 4h - 4) - (h^3 + 5h^2 - 8h + 2)$.

- a) $-h^3 - 4h^2 + 12h - 6$
- b) $h^3 - 4h^2 + 12h - 6$
- c) $h^3 + 4h^2 + 12h - 6$
- d) $-h^3 - 4h^2 + 12h + 6$

Module # 2

Content:

- *Continue with Evaluating Expressions*
- *Order of Operations*
- *Combining Like Terms*

Examples: See above

Module #3

Content:

- *Linear Expressions/Equations/Inequalities:*

EX: Simplify $4(x - 1) + 5(x + 2) + 17$

- a) $9x + 23$
- b) $9x + 31$
- c) $x + 23$
- d) $x + 31$

EX: If $3x + 1 = 7$, what is the value of x ?

(Hint: Work backward, or approximate the answer)

- a) 2
- b) $7/3$
- c) $8/3$
- d) 6

EX: Which of the following is equivalent to $4x - 8 > -12$

- a) $x < -1$
- b) $x < 1$

- c) $x > 1$
- d) $x > -1$

EX: Which of the following is equivalent to $-4x - 8 > -12$

- a) $x < -1$
- b) $x < 1$
- c) $x > 1$
- d) $x > -1$

- *Difference between equations/expressions:*

EX: Which of the following is equivalent to $2x - 1 + 4x - 3$?

- a) $6x - 4$
- b) $2x - 4$
- c) $6x + 4$
- d) $x = 2$

Module # 4

Content:

- *Solving More Difficult Linear Equations*

EX: Solve $\frac{-2}{3}d + 2 \leq \frac{1}{3}d - 8$

- a) $d \geq 10$
- b) $d \leq 10$
- c) $d \geq -6$
- d) $d \leq -6$

EX: If $\frac{3}{4}x + x = 7$, what is the value of x ?

(Hint: Work backward, or approximate the answer)

- a) 4
- b) 7
- c) $49/4$
- d) 28

EX: What is the solution of the equation $2x - 5(3 - x) = 6$?

- a) 3
- b) 7
- c) -7

d) -3

- **Literal Translations**

EX: A club is having a bake sale. They spend \$50 on supplies plus \$1 per pie. If they sell each pie for \$5 and they sell x pies, how much money do they make after expenses?

- a) $4x-50$
- b) $5x-50$
- c) $4x+50$
- d) $5x+50$

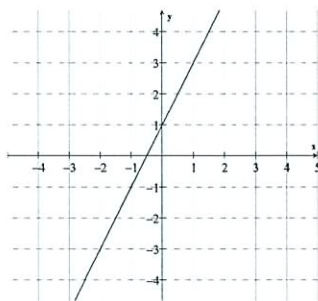
EX: The sum of twice x and 10 is greater than 6.

- a) $2x+10 > 6$
- b) $2x+10 < 6$
- c) $2(x+10) \geq 6$
- d) $2(x+10) < 6$

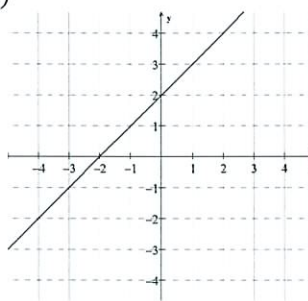
- **Graphing Linear Equations**

EX: The scale of each graph is 1 and is shown in the xy -plane. Which of the following is the graph of $y = 2x - 1$?

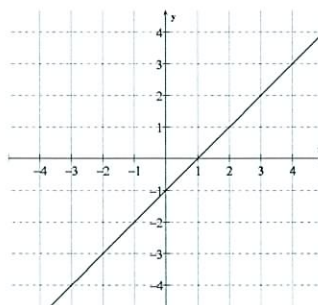
a)



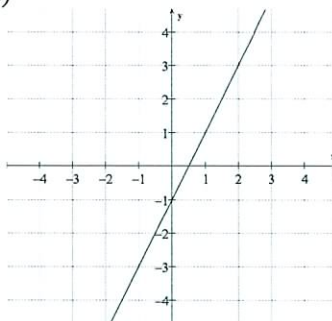
b)



c)



d)



Module #5

- **FOILing**

EX: Expand $(3x - 5)^2$.

- a) $9x^2 - 30x + 25$
- b) $9x^2 - 25$
- c) $9x^2 + 25$
- d) $9x^2 + 30x + 25$

EX: Which of the following is equivalent to $(x-1)^2$?

- a) $x^2 + 1$
- b) $x^2 + 2x + 1$
- c) $x^2 - 2x + 1$
- d) $x = 1$

EX: Factor $4x^2 - 9$

(Hint: FOIL the answers)

- a) $(2x-3)^2$
- b) $(2x+3)^2$
- c) $(2x+3)(2x-3)$
- d) $(4x+3)(4x-3)$

EX: Expand $(x-5)(x-2)$.

- a) $x^2 - 7x + 10$
- b) $x^2 + 7x + 10$
- c) $x^2 - 7x - 10$
- d) $x^2 + 7x - 10$

Module #6

- *First half of session - Sample Placement Accuplacer test*
The following website will give sample questions and elementary algebra questions:
http://www.collegeboard.com/prod_downloads/student/testing/accuplacer/accuplacer-sample.pdf
- *Second half of session - Review questions focusing on test strategy and test taking tips*

Other Web Resources

The websites listed below offer help to review for the test .

Algebra Study Modules on the OCC website review MATH 011 Concepts
www.ocean.edu/MathBasicSkillsPub/index.htm

The Math Page – A complete review of Arithmetic and Algebra. It is very user friendly.
www.themathpage.com

This comprehensive site reviews principles from basic mathematics through calculus. Try the Pre-Algebra and Algebra sections for review.
www.math.com