Bridge to College Mathematics

Upper 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.

High Level (score 51-75)

This review is broken down into 5 -1 hour sessions, called modules. Here are outlines of the 5 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:

The first modules covers test taking strategies and multiplying binomials.

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 $45(x-1)+100$?

a) For a consultation a lawyer charges $100 for the first hour and $45 for each additional hour. How much does he charge for x hours?
b) For a consultation a lawyer charges $45 for the first hour and $100 for each additional hour. How much does he charge for x hours?
c) For a consultation a lawyer charges a fixed fee of $100 plus $45 dollars per hour. How much does he charge for x hours?
d) For a consultation a lawyer charges a fixed fee of $45 plus $100 dollars per hour. How much does he charge for x hours?

- ***Understand the Question***

EX: The picture area of a square picture frame with side x is equal to $(1-x)^2$. What is the picture area if $x = 5$?

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

- ***What answer would make sense***

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: The picture area of a square picture frame with side x is equal to $(1-x)^2$. What is the picture area if $x = 5$?

a) -16
b) -36
c) 16
d) 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) -100, -50, 50, 100
b) -50, -100, 50, 100
c) -50, 50, -100, 100
d) -100, 100, -50, 50

EX: Which of the following is the least?

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

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: If $y = 2x^3$**, which of the following is equivalent to** x^6**?**

a) $\left(\frac{y}{2}\right)^2$

b) y^2

c) y^3

d) $\left(\frac{y}{3}\right)^2$

- ***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: Simplify $\sqrt{48}$.

a) $4\sqrt{3}$

b) $2\sqrt{3}$

c) 6

d) 12

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

1	2	3	…	x
3	5	7		?

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

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

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

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) 49/4
d) 28

- ***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:

- ***Multiplying Binomials (FOIL)***

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 represents the area of the rectangle with height $2x+1$ and width $3x-2$?

a) $6x^2-x-2$
b) $6x^2+x-2$
c) $6x^2+x+2$
d) $6x^2-x+2$

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) $(4x+3)(4x-3)$
d) $(2x+3)(2x-3)$

Module 2:

Content for Module # 2

- ***Factoring***

  - Trinomials with a leading coefficient of one
  - Difference of Two Squares
  - Greatest Common Factor

Module 3:

Content for Module # 3

- ***Exponents/roots/ rational expressions***

EX: Simplify $\dfrac{3x+6}{9x^3+81x}$

a) $\dfrac{x+2}{3x(x^2+9)}$

b) $\dfrac{6}{3x+9}$

c) $\dfrac{2}{x^2+3}$

d) $\dfrac{x+2}{3x(x+3)(x-3)}$

EX: Which of the following is equivalent to $\dfrac{2^{10}}{2^5}$ **?**

a) 2^2
b) 2^5
c) 2^{15}
d) 2

EX: Simplify $\sqrt{48}$.

a) $4\sqrt{3}$
b) $2\sqrt{3}$
c) 6
d) 12

(Hint for Instructor: $\sqrt{48} = 4\sqrt{3}$. Students should know how to work both directions, square the outside multiply by inside to get original)

EX: Simplify $\dfrac{2}{x+2}$. **(Note: Be sure that students do NOT cancel 2's)**

a) $\dfrac{1}{x+1}$
b) $x+1$
c) 1
d) Cannot be simplified further

Module 4:

Content

- ***Linear equations/expressions/inequalities – more complicated***

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

a) $3x^3+\dfrac{127}{11}x-\dfrac{7}{4}$

b) $3x^2+\dfrac{127}{11}x-\dfrac{7}{4}$

c) $3x^2+\dfrac{127}{11}x-\dfrac{7}{2}$

d) $3x^2+\dfrac{127}{22}x-\dfrac{7}{4}$

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 inequalities best represents the sentence "The sum of x and -5 is less than 40"?

a) $x+5<40$
b) $x+5>40$
c) $x-5<40$
d) $x-5>40$

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

EX: Simplify $3x^2-5x-2x^2+6.5x$

a) $x^2+1.5x$
b) $2.5x^2$
c) 2.5 x
d) $x^2+11.5x$

EX: Simplify $4(x-1)+0.5(x+2)+17$

a) $4.5x + 14$
b) $3.5x + 14$
c) $4.5x + 22$
d) $3.5x + 22$

- ***Literal translations – real life applications***

EX: Which problem best represents $45(x-1)+100$?

a) For a consultation a lawyer charges \$100 for the first hour and \$45 for each additional hour. How much does he charge for x hours?
b) For a consultation a lawyer charges \$45 for the first hour and \$100 for each additional hour. How much does he charge for x hours?
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d) For a consultation a lawyer charges a fixed fee of \$45 plus \$100 dollars per hour. How much does he charge for x hours?

EX: A club is having a bake sale. The 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?

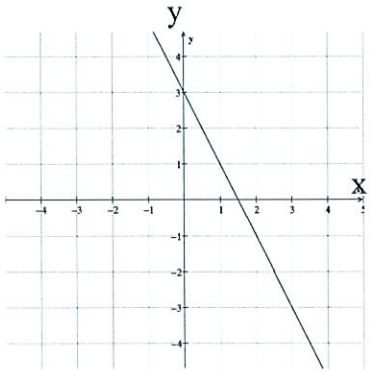
a) $4x-50$
b) $5x-50$
c) $4x+50$
d) $5x+50$

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 (slope)/ Graph the equation, equation to graph and vice versa***

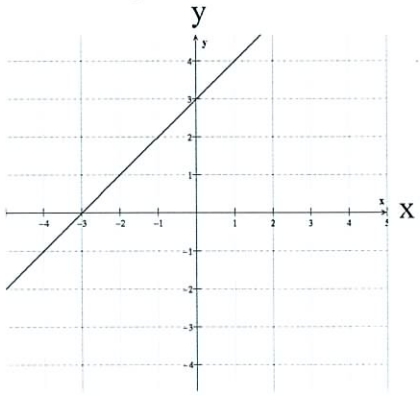
Ex: Graph has a scale of 1 unit.



Which of the following is the slope of the line shown above?

a) -2
b) ½
c) ½
d) 2

EX: Graph has a scale of 1 unit.



What is the equation of the line shown above?

a) $y = 3x + 1$
b) $y = x + 3$
c) $y = x - 3$
d) $y = x + 2$

Module 5:

- ***First half of session - Sample Placement Accuplacer test***
  The following website will give sample 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