Enclosed please find the following submission for Community Education regarding the non-credit gateway course of **INTRODUCTION TO THE MATHEMATICS OF DOSAGE**

- Appendix B
- Course Outline
- Course Syllabus
- Assessment plan
- Roster example
- Sign-in sheet example
- Attendance policy-included in the Course Outline, “L”
- Instructor evaluation
- Pre-test and post-test
- Non-credit course number that aligns to academic credit bearing course-see Appendix B, 13a and 13b.
Appendix B

Request Form: Approval of State Aid for a Non-Credit Remedial Course

<table>
<thead>
<tr>
<th>Campus</th>
<th>1. Name: (If course to be offered at a branch campus, please specify.) SUNY ERIE COMMUNITY COLLEGE/COMMUNITY EDUCATION/CITY CAMPUS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Name: Carrie Kahn, Executive Dean Community Education 3. Email: <a href="mailto:kahn@ecc.edu">kahn@ecc.edu</a> 4. Phone: 716.851.1800</td>
</tr>
<tr>
<td>Program Contact</td>
<td>5. Name: Richard Washousky Executive VP of Academic Affairs 6. Email: <a href="mailto:Washousky@ecc.edu">Washousky@ecc.edu</a></td>
</tr>
<tr>
<td>Chief Academic Officer</td>
<td>7. Signature: 8. Date</td>
</tr>
</tbody>
</table>

Note: Signature of the Chief Academic Officer assures that the proposed course or program is consistent with SUNY policy and affirms full academic oversight by the campus. Signature also verifies that quality controls, including assessment and reporting requirements are in place and satisfy §602.5 and MSCHE accreditation standards.

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<thead>
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<tbody>
<tr>
<td></td>
<td>11. Course Description: This course is intended for those who are interested in health related areas. Topics covered will include, Arabic and Roman Numerals, ratio, rates and proportions, metric system, apothecary, avoirdupois and household system, conversions within each system, conversions from one system to another, dosage calculations of oral and parenteral drugs for adult and pediatric patients, and preparation of solutions, interpreting drug orders and calculating doses, reducing and enlarging formulas and compounding, reconstitution of dry powders, intravenous flow rates, temperature conversions, common business math and terms used, measures of central tendency and frequency distribution.</td>
</tr>
<tr>
<td></td>
<td>12. Please separately attach to this form a course syllabus</td>
</tr>
<tr>
<td></td>
<td>See attached syllabus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alignment with Credit-Bearing Coursework</th>
<th>13. Identify the credit-bearing course and/or program for which the proposed non-remedial course or program is designed to prepare students.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Designation &amp; no. b. Course title:</td>
</tr>
<tr>
<td></td>
<td>MT-111 Mathematics of Dosage</td>
</tr>
<tr>
<td></td>
<td>14. Is this course equivalent to any financial aid-eligible course offered on a semester basis—for imputed credit or equivalent credit? If so, identify course designation, number and title in the boxes below</td>
</tr>
<tr>
<td></td>
<td>a. Designation &amp; no. b. Course title:</td>
</tr>
<tr>
<td></td>
<td>(eg. CTE 151):</td>
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<thead>
<tr>
<th>Alignment with Guidelines/Campus/SUNY Priorities</th>
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<tbody>
<tr>
<td>15. Describe how the course or program is consistent with the <em>Non-credit Remedial Course Aid: Program Guidelines</em> as well as with campus and SUNY mission/priorities:</td>
</tr>
<tr>
<td>Per the MTP 13(4) guidelines, this course will correct or improve “such basic skills as oral and written communications, reading, analytical concepts and general study habits and patterns, to overcome in part or in whole any marked deficiency which interferes with a student’s ability to pursue an educational objective effectively” and does not focus on computer skills or community service type activities.</td>
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<tr>
<td>The ECC Mission Statement commits the institution to meet “the needs of a diverse student body” and to contribute to “regional economic vitality by providing excellent, flexible, affordable and accessible educational programs in a multi-campus environment committed to continuous improvement.” The Vision Statement states that SUNY ECC strives toward “a future of accessible education….where students can acquire career competencies…along with the resources to achieve their goals.”</td>
</tr>
<tr>
<td>The proposed offerings would be quite compatible with Erie Community College and SUNY missions, guidelines and priorities.</td>
</tr>
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<tr>
<th>Faculty</th>
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<td>16. Describe requirements for faculty credentials and experience.</td>
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<tr>
<td>Faculty members assigned to this course will bear credentials substantially equivalent to those teaching MT11; namely, an MBA or J.D. degree and at least three years of experience teaching in this area, and or working in a responsible position with the materials covered in this course.</td>
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<thead>
<tr>
<th>Course Schedule</th>
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<tbody>
<tr>
<td>17. No. of meetings per week: Five</td>
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<tr>
<td>18. How many hours: Fifteen/week</td>
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<tr>
<td>19. How many weeks: Three</td>
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<th>Course Location</th>
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<tr>
<td>20. On campus, community site, extension center, etc.? Instruction will take place ECC three campus locations.</td>
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<tr>
<th>Enrollment/Fees</th>
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<tr>
<td>21. Confirm that course is open admission (y/n): Yes</td>
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<tr>
<td>22. Estimated semester / annual enrollment (headcount): 250 annually</td>
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<tr>
<td>23. Estimated annual avg. course FTE: 25</td>
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<td>24. Course tuition per student: $0. One Stop customers entering college are prohibited from paying fees.</td>
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<tr>
<td>25. Course fees per student:</td>
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<tr>
<td>26. Co-sponsor, if any:</td>
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<tr>
<td>27. Funding sources other than non-credit remedial State aid if applicable:</td>
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<tr>
<th>Assessment</th>
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<tr>
<td>28. Please separately attach to this form an Assessment Plan.</td>
</tr>
<tr>
<td>• Describe the assessment plan for the course/program, including methodology, frequency, and how results will be used to improve student success (note, regular assessments must be conducted for each State-aidable non-credit remedial course to gauge its effectiveness in preparing students for credit-bearing academic study).</td>
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Please submit form and required attachments via e-mail to: noncredit@sysadm.suny.edu.
A. **Unit Code and Suggested Course Title:** NCR-111 Introduction to the Mathematics of Dosage

B. **Curriculum/Program:** Community Education

C. **Catalog Description:** This course is a non-credit remedial/developmental course designed for the adult learner who is seeking instruction concerned with diagnosing, correcting and improving inadequacies in the area of quantitative business methods that interfere with the adult learner’s ability to effectively pursue their educational objectives.

Topics covered will include, Arabic and Roman Numerals, ratio, rates and proportions, metric system, apothecary, avoirdupois and household system, conversions within each system, conversions from one system to another, dosage calculations of oral and parenteral drugs for adult and pediatric patients, and preparation of solutions, interpreting drug orders and calculating doses, reducing and enlarging formulas and compounding, reconstitution of dry powders, intravenous flow rates, temperature conversions, common business math and terms used, measures of central tendency and frequency distribution. These skills will better prepare the adult learner for proficiency in college coursework. This course will prepare the adult learner for the colleges ACCUPLACER and entrance into the credit bearing course MT-111.

D. **Duration of Instructional Period:** The course will offer 45 academic clock hours of instruction, five days per week, three hours per day, for three weeks to equal 45 academic hours of instruction.

E. **Academic Credit/Contact Hours:** Not applicable, this is a non-credit remedial/developmental course which will align with gateway credit bearing courses to meet the new SUNY objective.

G. Course Outcomes: Upon completion of the course, the student will:

1. Perform basic mathematical operations needed to compute dosages
2. Identify the three systems of measurement used in the preparation and administration of medications
3. Convert units within each system and between the three systems of measurement
4. Solve dosage problems that involve oral medications
5. Solve problems involving parenteral medications
6. Determine infusion rates and times for intravenous medications
7. Calculate and determine safe dosage for children and infants based on weight
8. Calculate and describe how to prepare solutions
9. Read the orders and determine if calculated dosage is reasonable

H. Program Competencies: To assist the adult learner to attain an academic degree.

I. SUNY General Education Knowledge and Skills Areas: N/A

J. ECC Learning Outcomes:
   1. Communication (Level 1): Outcomes 1 through 3.
   2. Information Literacy (Level 1): Outcomes 5 (Quantitative Reasoning).
   3. Critical Analysis and Reasoning (Level 1).
   4. General Educations Requirements (SUNY).

K. Student Learning:
   1. Evaluation of Learning: The adult learner will be presented with in-class learning and written assignments, tests, quizzes and daily assignments, mid-term assessment of knowledge.
   2. Assessment of Learning /Outcome Measurement: The adult learner will be assessed at the beginning of the training to ascertain existing knowledge in the area of study, and conclude with an assessment to measure knowledge growth and improvement.

L. Attendance Policy/Repetition: The adult learner is expected to attend all training sessions, with a minimum of 75% class attendance. The adult learner may repeat the training a maximum of two times per subject, per year; subject to a change in curriculum.

M. Library Resources: Instructors will define a collection of library resources appropriate to the learner’s academic area of interest.
N. Topical Outline:
   1. Mathematics review
   2. Systems of measurement
   3. Interpreting drug orders and calculating dosages
   4. Reducing and enlarging formulas and compounds
   5. Parenteral medications
   6. Intravenous medications
   7. Preparation of solutions

O. Outline Prepared by: Diane Zych, Erie Community College.

   Date: August 2014

   Last update: October 30, 2014
Course: NCR-111 Introduction to the Mathematics of Dosage


Assessment: Test of Adult Basic Education (TABE), to include:
Pre-test TABE 9 for Mathematical Computations
Pre-test TABE 9 for Applied Mathematics
Post-test TABE 10 for Mathematical Computations
Post-test TABE 10 for Applied Mathematics

Coursework: Perform basic mathematical operations needed to compute dosages.
Identify the three systems of measurement used in the preparation and administration of medications.
Convert units within each system and between the three systems of measurements.
Solve dosage problems that involve oral medications.
Solve problems involving parenteral medications.
Determine infusion rates and times for intravenous medications.
Calculate and determine safe dosage for children and infants based on their weight.
Calculate and describe how to prepare solutions.
Read the orders given and the labels on medications accurately.
Determine if calculated dosage is reasonable.

Attendance: The adult learner is expected to attend all training sessions, with a minimum of 75% class attendance. The adult learner may repeat the training a maximum of two times per subject, per year; subject to a change in curriculum.
Assignments: The adult learner will be presented with in-class learning and written assignments, tests, quizzes and daily assignments, mid-term assessment of knowledge.

Evaluation: The adult learner will be assessed at the beginning of the training to ascertain existing knowledge in the area of study, and conclude with an assessment to measure knowledge growth and improvement.

Expectations: This course will introduce the adult learner with the mathematic skills necessary to enter into college level courses. This course will provide the adult learner with general concepts and patterns to promote success in college level learning.
All adult learners will be given a pre-test on the first day of instruction. This pre-test may include multiple choice, true/false and or quantitative responses. On the last day of the course, a similar, but not identical post-test will be administered and graded.

Pre-test and post-test results will be compared for each adult learner. If post-test results are roughly equal to or lower than pre-test results, attempts will be made to ascertain why progress was not achieved. Where substantial progress was observed, and effort will also be made to identify need areas with the goal of improving delivery methods.

Results will be recorded and retained to use to improve both the instructional methodology of the lectures and the design of the testing used.

Assessment: Test of Adult Basic Education (TABE), to include:
Pre-test TABE 9 for Mathematical Computations
Pre-test TABE 9 for Applied Mathematics
Post-test TABE 10 for Mathematical Computations
Post-test TABE 10 for Applied Mathematics
<table>
<thead>
<tr>
<th>CourseName</th>
<th>Course No</th>
<th>StartDate</th>
<th>Campus</th>
<th>Room</th>
<th>Instructor</th>
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Total: _______________
Erie Community College
Department of Workforce Development

SIGN IN SHEET

Course Name ___________________________ Course No __________________

Campus _______________________________ Instructor __________________

Start Date ____________________________ Room _______________________

Last Name ______________________________
First Name:
Signature: ______________________________
Date: ________________________________
Email address: _________________________

Last Name ______________________________
First Name:
Signature: ______________________________
Date: ________________________________
Email address: _________________________

Last Name ______________________________
First Name:
Signature: ______________________________
Date: ________________________________
Email address: _________________________

Last Name ______________________________
First Name:
Signature: ______________________________
Date: ________________________________
Email address: _________________________
NON-CREDIT COURSE EVALUATION

Instructor ___________________________ Date ______________________
Course ___________________________ Location ______________________

1. Did this course meet your expectations? □ Yes □ No
2. Could any part of the presentation be improved? □ Yes □ No
3. Would you recommend this course to a co-worker or friend? □ Yes □ No
4. Have you ever visited Workforce Development /Community Education website at www.ecc.edu? □ Yes □ No
5. Does your profession require continuing education? □ Yes □ No
   If yes, what is your profession ________________________
6. How did you hear about this course? □ Course Brochure □ Website □ Postcard
   □ Newspaper □ Radio □ Other ______

INSTRUCTOR RATING AND EVALUATION

1. What was the quality of the instructor’s presentation? □ Poor □ Good □ Excellent
2. Rate the instructor’s course preparation? □ Poor □ Good □ Excellent
3. What was the quality of the course materials? □ Poor □ Good □ Excellent
4. Rate the course materials (relevant and up-to-date) □ Poor □ Good □ Excellent

Additional Comments (what you liked, improvements, any course suggestions)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Please list anyone you think may want to receive a course brochure or e-communication.
Name _____________________________________________________________
Address _______________________________________________________________________
City __________________________ State ______ Zip _________
Email __________________________

Erie Community College is an Equal Opportunity Employer. We request your voluntary completion of the following questions which will be used only for the purpose of monitoring the success of our Affirmative Action Plan. Please identify yourself as a member of a racial ethnic group as indicated here:

01) □ White 02) □ Black 03) □ Hispanic 04) □ Asian/Pacific
05) □ Native American or Alaskan Native 06) □ Non-Resident Alien

Age Group □ (18-25) □ (26-35) □ (36-45) □ (46-55) □ (55-63) □ (64+) □ Male □ Female
Sample A

Which of these expressions has the same value as the expression in the box?

\[ 10 + 3 \]

<p>| | | | |</p>
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<tbody>
<tr>
<td>3 + 10</td>
<td>10 - 3</td>
<td>13 - 3</td>
<td>7 + 3</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>

1. Where do two perpendicular lines intersect?
   - A point
   - B segment
   - C ray
   - D line

2. Which of these cylinders is about 25% full?
   - F
   - G
   - H
   - J
It cost $526.30 to repair Carol's car. Rounded to the nearest ten dollars, how much did Carol pay?

A $500
B $520
C $530
D $550

Which of these numbers should go in the box to make the equation true?

\[(6 \times 3) \times (4 + 1) = 6 \times \Box \times 5\]

F 3
G 4
H 12
J 18

In which of these pairs of numbers are both numbers equivalent to \(\frac{1}{4}\)?

A 25%, 0.25
B 14%, 0.14
C 25%, 0.025
D 40%, 0.40

Bob's Diner opens every morning at 7:00 a.m. and closes at 8:30 p.m. How long is the diner open each day?

F 10 hours 30 minutes
G 12 hours 30 minutes
H 13 hours 30 minutes
J 14 hours 30 minutes

How can 8 ounces be expressed in pounds?

A \(\frac{1}{4}\) pound
B \(\frac{1}{2}\) pound
C 1 pound
D 2 pounds

Rachael has a coupon for 15% off her total lunch bill before tax. If \(t\) represents the total cost of her lunch items before tax, which of these expressions represents the savings from the coupon?

F \(t \times 0.15\)
G \(t \times 0.15\)
H \(t \times 0.15\)
J \(t + 0.15\)
An automobile manufacturer published a graph showing the colors of a specific model of car sold in one year. Study the graph. Then do Numbers 9 through 11.

9. According to the graph and the variables given below, which inequality is correct?

Let:
- \( r \) = percent of people who bought red cars
- \( b \) = percent of people who bought blue cars
- \( g \) = percent of people who bought green cars

\[ A \quad r > g \]
\[ B \quad r > b + g \]
\[ C \quad b > g \]
\[ D \quad g - r > b \]

10. What was the least popular car color?

- F green
- G red
- H blue
- J white

11. According to the graph, which of these is a correct statement?

- A Red, green, and black make up half the cars sold.
- B More than half the cars sold were red, white, or blue.
- C The number of gray cars sold was less than the number of green cars sold.
- D There were fewer green cars sold than red cars.
The table shows the cost of producing one hammer at the Hudson Hardware Company. Study the table. Then do Numbers 12 and 13.

<table>
<thead>
<tr>
<th>Production Cost of One Hammer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
</tr>
<tr>
<td>Metal</td>
</tr>
<tr>
<td>Labor</td>
</tr>
</tbody>
</table>

12 The Hudson Hardware Company sells one hammer for $20.00. How much money is left after the cost of labor and materials is deducted from the selling price?
- F $13.00
- G $16.00
- H $17.00
- J $27.00

13 Which expression can be used to find the total cost of materials and labor needed to produce \( n \) hammers?
- A \( 7 + n \)
- B \( 7n \)
- C \( 3n \)
- D \( n + 3 \)

14 Which of these shapes is a four-sided figure with only one pair of parallel sides?
- F trapezoid
- G rectangle
- H square
- J rhombus
The bar graph below shows the interest rates on personal loans at several banks for one week in March. Study the graph. Then do Numbers 15 through 17.

The Neighborhood Bank offers a lower rate on commercial accounts than on personal accounts. If the commercial rate is 1.25% lower than the personal rate, what is the rate for commercial accounts?

16

A 9.4%
B 9.5%
C 9.25%
D 9.75%

15

Amy took out a loan at Valley Bank. What rate of interest was she charged?

17

A The average interest rate at the four banks is about 9%.
B The difference between the highest rate and lowest rate is less than 1%.
C All the bank interest rates are higher than 9.75%.
D The average interest rate at the four banks is about 10%.

18

In which of these pairs of numbers would both numbers round to 6.23?

A 6.232 and 6.236
B 6.231 and 6.233
C 6.229 and 6.239
D 6.222 and 6.238
**Sample A**

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<td>B</td>
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<td>C</td>
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<td>D</td>
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<tr>
<td>E</td>
<td>None of these</td>
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12 + 7 = 19

1. 

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<tr>
<td>A</td>
<td>4,235</td>
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<tr>
<td>B</td>
<td>4,270</td>
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<tr>
<td>C</td>
<td>4,284</td>
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<td>D</td>
<td>4,305</td>
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<td>E</td>
<td>None of these</td>
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475 > 9

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<td>G</td>
<td>806</td>
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<tr>
<td>H</td>
<td>86</td>
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<tr>
<td>J</td>
<td>860</td>
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<td>K</td>
<td>None of these</td>
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3) 258

4. 

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<tr>
<td>F</td>
<td>17 R 5</td>
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<td>G</td>
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<td>10 R 3</td>
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<td>J</td>
<td>18 R 1</td>
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<td>K</td>
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<tr>
<td>Column 1</td>
<td>Column 2</td>
<td>Column 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 1.604</td>
<td>A $73.11</td>
<td>A 34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B 1.616</td>
<td>B $183.11</td>
<td>B 304</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 2.206</td>
<td>C $84.11</td>
<td>C 340</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 1.664</td>
<td>D $83.11</td>
<td>D 3,004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E None of these</td>
<td>E None of these</td>
<td>E None of these</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>F 2</td>
<td>F 584,136</td>
<td></td>
</tr>
<tr>
<td>G 2 $\frac{1}{4}$</td>
<td>G 73,017</td>
<td></td>
</tr>
<tr>
<td>H 3</td>
<td>H 573,036</td>
<td></td>
</tr>
<tr>
<td>J $2 \frac{1}{2}$</td>
<td>J 219,051</td>
<td></td>
</tr>
<tr>
<td>K None of these</td>
<td>K None of these</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A $764.58$</td>
<td>A 34</td>
<td></td>
</tr>
<tr>
<td>B $822.00$</td>
<td>B 304</td>
<td></td>
</tr>
<tr>
<td>C $765.58$</td>
<td>C 340</td>
<td></td>
</tr>
<tr>
<td>D $864.58$</td>
<td>D 3,004</td>
<td></td>
</tr>
<tr>
<td>E None of these</td>
<td>E None of these</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>F 2.61</td>
<td>F 1 $\frac{1}{16}$</td>
<td></td>
</tr>
<tr>
<td>G 26.1</td>
<td>G 1</td>
<td></td>
</tr>
<tr>
<td>H 18.81</td>
<td>H 3 $\frac{1}{16}$</td>
<td></td>
</tr>
<tr>
<td>J 28.1</td>
<td>J $\frac{1}{2}$</td>
<td></td>
</tr>
<tr>
<td>K None of these</td>
<td>K None of these</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>A 7</td>
<td>17</td>
</tr>
<tr>
<td>-----</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>0 ÷ 7 =</td>
<td>B 0</td>
<td>5283 ÷ 6 =</td>
</tr>
<tr>
<td></td>
<td>C 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E None of these</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14</th>
<th>F 40</th>
<th>18</th>
<th>F 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4 × 0 =</td>
<td>G 4</td>
<td>-3 + -4 =</td>
<td>G 1</td>
</tr>
<tr>
<td></td>
<td>H 0</td>
<td></td>
<td>H -1</td>
</tr>
<tr>
<td></td>
<td>J 40</td>
<td></td>
<td>J -7</td>
</tr>
<tr>
<td></td>
<td>K None of these</td>
<td></td>
<td>K None of these</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15</th>
<th>A 0.41</th>
<th>19</th>
<th>A 4.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.25</td>
<td>B 0.45</td>
<td>20% of 20 =</td>
<td>B 0.01</td>
</tr>
<tr>
<td>5)2.25</td>
<td>C 0.045</td>
<td></td>
<td>C 0.4</td>
</tr>
<tr>
<td></td>
<td>D 4.50</td>
<td></td>
<td>D 1.0</td>
</tr>
<tr>
<td></td>
<td>E None of these</td>
<td></td>
<td>E None of these</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16</th>
<th>F 5</th>
<th>20</th>
<th>F 8 \frac{1}{20}</th>
</tr>
</thead>
<tbody>
<tr>
<td>\frac{4}{5} ÷ \frac{1}{5}</td>
<td>G \frac{4}{5}</td>
<td>3 \frac{1}{10} + 5 \frac{1}{10}</td>
<td>G \frac{8}{10}</td>
</tr>
<tr>
<td></td>
<td>H 4</td>
<td></td>
<td>H \frac{8}{5}</td>
</tr>
<tr>
<td></td>
<td>J \frac{3}{5}</td>
<td></td>
<td>J \frac{8}{5}</td>
</tr>
<tr>
<td></td>
<td>K None of these</td>
<td></td>
<td>K None of these</td>
</tr>
</tbody>
</table>
21. What is 80% of $5.00?
A $0.40  B $4.00  C $4.20  D $5.80  E None of these

22. \(-1 \times -12 = \)
F 13  G 12  H -12  J 13  K None of these

23. 2.5% of 100 =
A 0.025  B 0.25  C 2.5  D 25.0  E None of these

24. \(-3 - -2 = \)
F -1  G 5  H 1  J -5  K None of these

25. 16% of \(\Box\) = $32
A $200  B $16  C $48  D $2  E None of these
Which of these expressions has the same value as the expression in the box?

\[
\begin{align*}
A & : 10 + 3 \\
B & : 3 + 10 \\
C & : 10 - 3 \\
D & : 13 - 3 \\
E & : 7 + 3
\end{align*}
\]

STOP

Which point on the number line indicates a number that is less than 9.1 and greater than 6.5?

\[
\begin{align*}
P & : \text{Point R} \\
Q & : \text{Point Q} \\
P & : \text{Point P} \\
S & : \text{Point S}
\end{align*}
\]

Which of these numbers is the same as 34.921 rounded to the nearest thousand?

\[
\begin{align*}
F & : 30,000 \\
G & : 34,000 \\
H & : 34,900 \\
J & : 35,000
\end{align*}
\]
The line graph below shows sales for a local bookstore over a period of 6 years. Study the graph. Then do Numbers 3 through 5.

**Book Sales**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (Thousands of Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>60</td>
</tr>
<tr>
<td>1</td>
<td>90</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
</tr>
<tr>
<td>5</td>
<td>65</td>
</tr>
<tr>
<td>6</td>
<td>55</td>
</tr>
<tr>
<td>7</td>
<td>50</td>
</tr>
</tbody>
</table>

3. What was the total in sales for Year 5?
   - A $60,000
   - B $65,000
   - C $70,000
   - D $75,000

4. In what year did the bookstore have sales of approximately $75,000?
   - F Year 3
   - G Year 4
   - H Year 5
   - J Year 6

5. Last month, 5,389 people shopped at the bookstore. What is this number rounded to the nearest hundred?
   - A 5,400
   - B 5,300
   - C 5,000
   - D 5,500
The table below shows workers' average wages at manufacturing plants in four regions of the country. Study the table. Then do Numbers 6 and 7.

<table>
<thead>
<tr>
<th>Plant Location</th>
<th>Last Year</th>
<th>This Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Region</td>
<td>$18.75</td>
<td>$20.50</td>
</tr>
<tr>
<td>Northern Region</td>
<td>$20.00</td>
<td>$22.00</td>
</tr>
<tr>
<td>Southern Region</td>
<td>$21.50</td>
<td>$21.50</td>
</tr>
<tr>
<td>Western Region</td>
<td>$19.95</td>
<td>$23.80</td>
</tr>
</tbody>
</table>

6. What is the average hourly wage this year in the Northern Region?
   - F $18.75
   - G $20.00
   - H $20.50
   - J $22.00

7. About how much did the average hourly wage increase from last year to this year for workers in the Western Region?
   - A $3.00 per hour
   - B $4.00 per hour
   - C $20.00 per hour
   - D $24.00 per hour
Bradley’s Furniture is having a spring sale. Study the information in the advertisement. Then do Numbers 8 through 10.

Bradley’s Furniture
Spring Sale

5-Piece Living Room Set
Purchase Today for $895!
Finance Plan:
5% down and 12 easy monthly payments.

*Each payment includes a $14.00 finance charge.

8 Julie decided to buy the living room set using the finance plan. She made a down payment of 5% of the purchase price. About how much was Julie’s down payment?
   F $5.00
   G $50.00
   H $400.00
   J $450.00

9 Which of these is not needed to find out how much it will cost to finance the living room set?
   A the number of monthly payments
   B the finance charge with each payment
   C the amount of money toward a down payment
   D the number of years the furniture will be owned

10 A competitor of Bradley’s Furniture is selling the same 5-piece living room set. The competitor offers customers the following payment option: $500 down payment, then $20 per month for 24 months. What is the total cost of the set?
   F $544
   G $580
   H $980
   J $2,420
Each vertex on the figure below is labeled. The length of each side is shown. Study the figure. Then do Numbers 11 through 13.

11. How many faces does the figure have?
A 4
B 6
C 8
D 12

12. If segment $\overline{MO}$ is drawn in the figure, what will be the area ($A$) of triangle $\triangle MOP$?
\[ A = \frac{1}{2} \times b \times h \]
F 8 square inches
G 12 square inches
H 16 square inches
J 32 square inches

13. Which line segments in the figure are perpendicular?
A $\overline{MN}$ and $\overline{OP}$
B $\overline{NO}$ and $\overline{RS}$
C $\overline{OP}$ and $\overline{TS}$
D $\overline{QR}$ and $\overline{QT}$

14. A computer program applies a certain rule to any number that the user inputs. A sample of Input and Output numbers is shown in the table below.

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>4</td>
<td>0.8</td>
</tr>
<tr>
<td>5</td>
<td>1.0</td>
</tr>
</tbody>
</table>

What rule does the program apply to the Input number to generate the Output number?
F multiply by 2.0
G subtract 1.6
H divide by 0.2
J multiply by 0.2
15. The Robinsons want to plant trees in their yard. It will take about 15 minutes to plant each tree. At this rate, how long will it take them to plant 8 trees?
   A 2 hours  
   B 3 hours  
   C 1 hour 20 minutes  
   D 1 hour 35 minutes

16. What is the value of \( p \) in the inequality in the box?
   \[ p \quad 3 > 8 \]
   F \( p < 5 \)  
   G \( p = 11 \)  
   H \( p > 5 \)  
   J \( p > 11 \)

17. Which of these is a true statement about the measure of angle \( R \)?
   A Angle \( R \) is greater than 90 degrees.  
   B Angle \( R \) is greater than 180 degrees.  
   C Angle \( R \) is an acute angle.  
   D Angle \( R \) is a right angle.

18. What is the name of the figure formed by the intersection of the two quadrilaterals below?
   F triangle  
   G trapezoid  
   H rectangle  
   J hexagon
Sample A

A 19
B 15
C 10
D 20
E None of these

12 + 7 =

A 1,232
B 1,444
C 1,252
D 1,242
E None of these

414 × 3 =

A 1,232
B 1,444
C 1,252
D 1,242
E None of these

9,118 × 5

A 45,550
B 55,590
C 45,590
D 45,690
E None of these

3

7
———

5

A 5
B 5
C 5
D 5
E None of these

A 57
B 59
C 59
D 59
E None of these

22 × 47 =

F 1,034
G 188
H 1,024
J 242
K None of these

STOP!
5  
8 \div 3 = 
A 1 \text{ R } 5  
B 3 \text{ R } 1  
C 2 \text{ R } 3  
D 2 \text{ R } 2  
E None of these

9  
\text{-8} \times 11 = 
A -88  
B -3  
C 88  
D 3  
E None of these

6  
3 + 0 = 
F -30  
G -3  
H 0  
J 3  
K None of these

10  
1.080  
\underline{-1.068}  
F 0.002  
G 0.912  
H 0.120  
J 0.022  
K None of these

7  
10 \times 3 = 
A -3  
B -30  
C 3  
D 30  
E None of these

11  
\frac{1}{2} \times \frac{1}{3} = 
A \frac{1}{6}  
B \frac{1}{5}  
C \frac{1}{2}  
D \frac{2}{3}  
E None of these

8  
4 \div 1.84 = 
F 0.46  
G 0.41  
H 0.64  
J 4.60  
K None of these

12  
125.994  
\underline{+ 16.023}  
F 141.017  
G 142.117  
H 141.917  
J 142.017  
K None of these
13

\[
\begin{align*}
6,480 \div 6 &= \\
A &= 108 \\
B &= 180 \\
C &= 1,080 \\
D &= 1,008 \\
E &= \text{None of these}
\end{align*}
\]

14

\[
\begin{align*}
949 \times 30 &= \\
F &= 27,470 \\
G &= 27,147 \\
H &= 28,470 \\
J &= 29,419 \\
K &= \text{None of these}
\end{align*}
\]

15

\[
\begin{align*}
8 \div 634 &= \\
A &= 140 \\
B &= 14 R 2 \\
C &= 105 R 6 \\
D &= 104 R 2 \\
E &= \text{None of these}
\end{align*}
\]

16

\[
\begin{align*}
1,000 \div 100 &= \\
F &= 100 \\
G &= 10 \\
H &= 100,000 \\
J &= 10 \\
K &= \text{None of these}
\end{align*}
\]

17

\[
\begin{align*}
1\% \text{ of } 100 &= \\
A &= 1 \\
B &= 10 \\
C &= 100 \\
D &= 101 \\
E &= \text{None of these}
\end{align*}
\]

18

\[
\begin{align*}
48)816 &= \\
F &= 22 \\
G &= 12 \\
H &= 17 \\
J &= 20 \\
K &= \text{None of these}
\end{align*}
\]

19

\[
\begin{align*}
6.2 \div 3.1 &= \\
A &= 1.922 \\
B &= 19.22 \\
C &= 192.2 \\
D &= 1.922 \\
E &= \text{None of these}
\end{align*}
\]

20

\[
\begin{align*}
\text{What is 100\% of 19?} \\
F &= 0.19 \\
G &= 1.0 \\
H &= 10 \\
J &= 19 \\
K &= \text{None of these}
\end{align*}
\]
21. \[ \frac{7}{8} + \frac{3}{16} = \]

22. \[ \frac{1}{2} + \frac{1}{4} = \]

23. What percent of 100 is 8?

24. 

25. 

STOP