

MAT087 Foundations I - Learning Outcomes

Course description:

Review of fundamental mathematical skills as a foundation for other mathematics courses. RDG091 is recommended. Credit is allowed for only MAT086 or MAT087.

MSLO'S	Sample problems										
1. (Application Level) Perform the basic operations with numbers of the real number system. (CSLO 2 & 4)	<ul style="list-style-type: none"> List all the numbers from the given set that are a.) natural numbers b.) whole numbers c.) integers d.) rational numbers e.) irrational numbers f) real numbers $\{-8, -\frac{2}{7}, 0, 0.5, \sqrt{3}, 8.5, 4\}$ Perform the following: $8 - (-6) - 9 + 4$ 										
2. (Application Level) Apply the rules of ratios, proportions, and percents to solve real word problems. (CSLO 2 & 4)	<ul style="list-style-type: none"> Last week 72 chairs were used for the meeting. This week 200% of that number of chairs are needed. How many chairs are needed? A vacuum is priced at \$348 with an allowed trade-in of \$110 on an old unit. If sales tax of $5\frac{1}{4}\%$ is charged on the price of the new vacuum unit before the trade in, find the total cost to the customer after receiving the trade-in. 										
3. (Application Level) Demonstrate appropriate order of operations. (CSLO 2 & 4)	<ul style="list-style-type: none"> Use the order of operations to simplify: $(\frac{4}{7})^2 - (\frac{1}{3} - \frac{1}{12}) \div \frac{7}{4}$ Use the order of operations to simplify: $-8 - [(6-3) - (-8-4)]$ 										
4. (Application Level) Apply methods of unit conversion in and between the metric and American systems to solve problems. (CSLO 2 & 4)	<p>Convert the measurements:</p> <ul style="list-style-type: none"> 552 cm to m [cm= centimeters; m= meters] Dan orders supplies for the science lab. Each of the 21 stations in the chemistry lab needs 4 feet of rubber tubing. If rubber tubing sells for \$7.25 per yard, how much will it cost to equip all the stations? 										
5. (Analysis Level) Calculate the measures of central tendency (mean, median, mode). (CSLO 2 & 4)	<ul style="list-style-type: none"> The following list gives the age of several residents (in years) in a village. Find the mean, median and mode of the list. 70,74,74,74,72,72,70,70,75 Use the chart of quiz scores to find the weighted mean. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Quiz Scores</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>2</td> </tr> <tr> <td>5</td> <td>3</td> </tr> <tr> <td>10</td> <td>3</td> </tr> <tr> <td>11</td> <td>3</td> </tr> </tbody> </table>	Quiz Scores	Frequency	2	2	5	3	10	3	11	3
Quiz Scores	Frequency										
2	2										
5	3										
10	3										
11	3										
6. (Analysis Level) Describe tendencies	<ul style="list-style-type: none"> Question: 										

and make conjectures and predictions, and create table, bar, circle, and line graphs based on the data set. (CSLO 2 & 4)

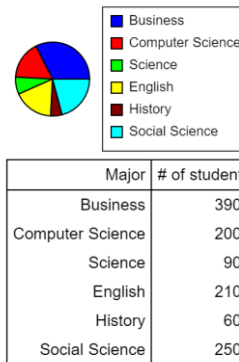
The amounts (in dollars) paid by 20 students for textbooks during the fall term are given on the right.

22 44 29 55 28
36 16 51 64 62
24 48 62 59 36
42 28 53 66 59

Fill in the correct frequencies in the frequency table based on the data.

Class Intervals	Frequency
10 – 19.99	<input type="text"/>
20 – 29.99	<input type="text"/>
30 – 39.99	<input type="text"/>
40 – 49.99	<input type="text"/>
50 – 59.99	<input type="text"/>
60 – 69.99	<input type="text"/>

- The circle graph shows the number of students at Rockford College who are enrolled in various majors. Find the ratio of history majors to social science majors. Simplify your answer.

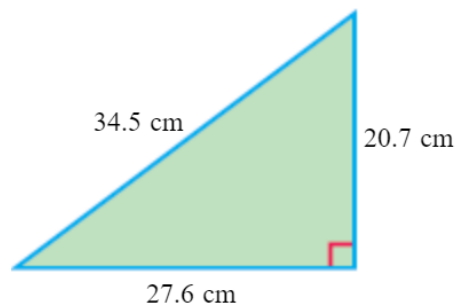


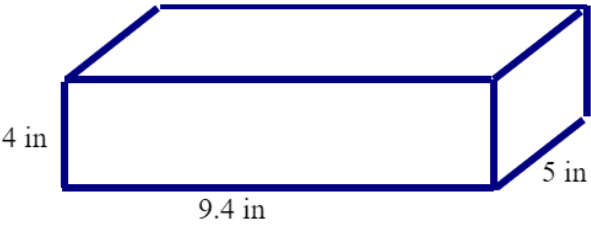
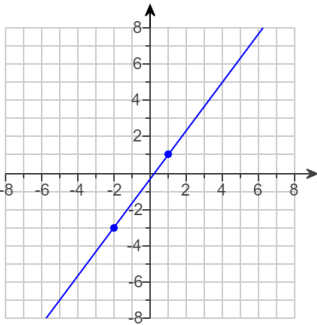
7. (Analysis Level)
Apply various problem-solving strategies to application problems. (CSLO 2 & 4)

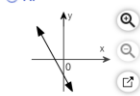
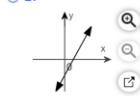
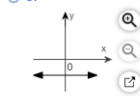
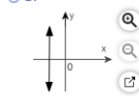
- A particular type of wood-frame door is priced at \$1860 with a sales tax of \$465. Find the rate of sales tax.
- Nearly 5 out of 7 people choose vanilla as their favorite ice cream flavor. If 182 people attend an ice cream social, how many would you expect to choose vanilla?

8. (Application Level)
Use basic geometry concepts to solve problems involving perimeter, area, and volume of geometric figures. (CSLO 2 & 4)

- Find the perimeter and area of the triangle below. Write the appropriate units and round your answer to the nearest tenth when needed.



	<ul style="list-style-type: none"> Find the volume and surface area of the figure. Write down the units and round your answer to the nearest tenth when needed. 
<p>9. (Application Level) Solve and apply simple linear equations. (CSLO 2 & 4)</p>	<p>Solve the equations below, be sure to simplify your answer:</p> <ul style="list-style-type: none"> $-5y+5-(-4y-6)=-3$ $4(2n+6)=2(3n+12)+2n$ <p>Evaluate the following expression for $x=-2$</p> <ul style="list-style-type: none"> $5-x$
<p>10. (Evaluation Level) Evaluate problems involving scientific notation, including converting numbers expressed as scientific notation to standard notation and vice versa. (CSLO 2 & 4)</p>	<ul style="list-style-type: none"> Convert the number to scientific notation 1,464,000,000 Multiply and write answer in (a) scientific notation and (b) standard notation. $(4 \times 10^7) \times (2 \times 10^4)$
<p>11. (Application Level) Construct linear models and graphs given multiple representations of the function and describe trends and predictions for a given data set. (CSLO 2 & 4)</p>	<ul style="list-style-type: none"> Write an equation in slope-intercept form of the line passing through the given point and having the given slope. $(8,6)$, $m=9$ Find the slope and equation of the line from the graph below. Set the equation of the line in slope intercept form. 
<p>12. (Comprehension Level) Describe the rate of change of a linear function. (CSLO 2 & 4)</p>	<ul style="list-style-type: none"> Which of the graphs shown below represent a negative slope, zero slope, positive slope and undefined slope.

	<p>Choose the correct graph below.</p> <p><input type="radio"/> A. </p> <p><input type="radio"/> B. </p> <p><input type="radio"/> C. </p> <p><input type="radio"/> D. </p> <ul style="list-style-type: none"> • Determine the slope of the following function, if it exists. $5x - 2y = 30$
<p>13. (Application Level) Graph linear equations in the Cartesian coordinate plane. (CSLO 2 & 4)</p>	<ul style="list-style-type: none"> • Find the intercepts and then use them to graph the equation. $5x + y = 10$ • Graph the following equation on a coordinate plane $f(x) = \frac{2}{5}x - 9$
<p>14. (Synthesis Level) Perform the basic operations of polynomials. (CSLO 2 & 4)</p>	<ul style="list-style-type: none"> • Multiply the following polynomial: $(m + 5n)^2$ • Divide the following polynomial $\frac{12x^5 - 4x^2 + 12}{4x}$
<p>15. (Application Level) Apply the laws of exponents, such as the product, quotient, and power rules and integer exponents. (CSLO 2 & 4)</p>	<p>Simplify the following</p> <ul style="list-style-type: none"> • $\frac{2x^3y^8}{4y^2}$ • $\frac{(x^4)^2 \cdot (2x^3)}{8x^{11}}$
<p>16. (Application Level) Identify and apply various strategies for success in mathematics such as a) resources, b) time management, c) effective listening and note-taking, d) test preparation, and g) techniques for overcoming test anxiety. (CSLO 3 & 4)</p>	<p>Additional resources can be found:</p> <ul style="list-style-type: none"> • If you have never looked at strategies or skills before, and need some guidance, try the VARK test below and see if knowing your learning style can help guide you. Now remember that it is important for you to be aware of this, but do not limit yourself to one. VARK test • Do you have test anxiety? How do you cope Anxiety test • How to study for a test https://www.youtube.com/watch?v=23Xqu0jXlfs