

### Review for the Pretest for MATD 0370, Elementary Algebra

We'll go pretty fast today, because there is a lot to review in very little time. If you need to be taught these topics, rather than just briefly reminded of them, then you need more attention than is available today.

If you need substantial work on a lot of these problems, you should go back and take the previous course, MATD 0330, Basic Math Skills.

If you just need additional explanation of some of the topics, look at these online resources:

PurpleMath website: <http://www.purplemath.com/modules/>

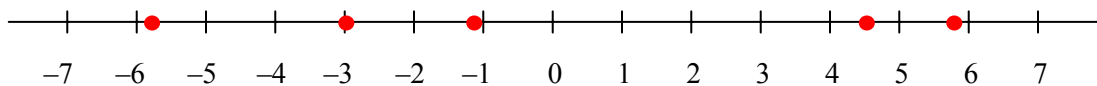
Mary Parker's equation lessons: <http://www.austincc.edu/mparker/0330/eqn/>

If you want more problems to practice on, find the Prerequisite Review Sheets at <http://www.austincc.edu/mthdept2/prereqd/>

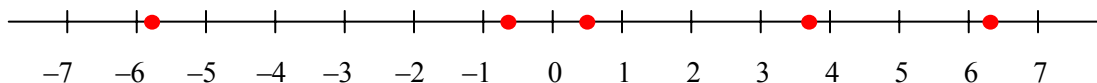
Topics	Problems	Answers																																
1. Conversions <ul style="list-style-type: none"> <li>• Fractions to decimals</li> <li>• Decimals to fractions</li> <li>• Decimals to percents</li> </ul>	Complete the table of equivalent notations. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Fraction Form</th> <th>Decimal Form</th> <th>Percent Form</th> </tr> </thead> <tbody> <tr> <td><math>\frac{9}{12}</math></td> <td></td> <td></td> </tr> <tr> <td></td> <td>0.61</td> <td></td> </tr> <tr> <td></td> <td></td> <td>2.8%</td> </tr> <tr> <td><math>3\frac{2}{3}</math></td> <td></td> <td></td> </tr> </tbody> </table>	Fraction Form	Decimal Form	Percent Form	$\frac{9}{12}$				0.61				2.8%	$3\frac{2}{3}$			<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Fraction Form</th> <th>Decimal Form</th> <th>Percent Form</th> </tr> </thead> <tbody> <tr> <td><math>\frac{9}{12}</math></td> <td>0.75</td> <td>75%</td> </tr> <tr> <td><math>\frac{61}{100}</math></td> <td>0.61</td> <td>61%</td> </tr> <tr> <td><math>\frac{28}{1000}</math></td> <td>0.028</td> <td>2.8%</td> </tr> <tr> <td><math>3\frac{2}{3}</math></td> <td><math>3.\bar{6}</math></td> <td><math>366.\bar{6}\%</math></td> </tr> </tbody> </table>			Fraction Form	Decimal Form	Percent Form	$\frac{9}{12}$	0.75	75%	$\frac{61}{100}$	0.61	61%	$\frac{28}{1000}$	0.028	2.8%	$3\frac{2}{3}$	$3.\bar{6}$	$366.\bar{6}\%$
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<p>2. Size of numbers.</p> <p>First put them on a number line.</p> <p>Notice negative numbers carefully. Is -6 less than -8 or greater than -8?</p> <p>Then be able to use &lt; and &gt; to write correct statements about the comparative sizes.</p>	<p>(a) Graph -3, 4.5, -1.1, 5.8 and -5.8 on a number line.</p> <p>(b) Graph <math>\frac{1}{2}</math>, <math>-\frac{2}{3}</math>, <math>3\frac{3}{4}</math>, <math>-5\frac{4}{5}</math>, and <math>6\frac{1}{4}</math> on a number line.</p> <p>Which symbol, &gt; or &lt;, makes a true statement when placed in the blank between the given pairs of numbers?</p> <p>(c) <math>1.3 \underline{\quad} 1.03</math>      (d) <math>-4.8 \underline{\quad} -4.61</math>      (e) <math>\frac{1}{2} \underline{\quad} \frac{7}{16}</math></p> <p>(f) <math>-\frac{6}{7} \underline{\quad} -\frac{7}{8}</math>      (g) <math>-2\frac{3}{4} \underline{\quad} -3\frac{1}{3}</math></p> <p>(h) Arrange the numbers 5.1, 5.01, <math>5.\bar{1}</math>, 5.023 from smallest to largest.</p> <p>(i) Arrange the numbers <math>\frac{2}{3}</math>, <math>\frac{4}{5}</math>, and <math>\frac{4}{7}</math> from smallest to largest.</p>	<p>(a) See number line below.</p> <p>(b) See number line below.</p> <p>(c) <math>1.3 &gt; 1.03</math>    (d) <math>-4.8 &lt; -4.61</math></p> <p>(e) <math>\frac{1}{2} &gt; \frac{7}{16}</math></p> <p>(f) <math>-\frac{6}{7} &gt; -\frac{7}{8}</math>    (g) <math>-2\frac{3}{4} &gt; -3\frac{1}{3}</math></p> <p>(h) 5.01, 5.023, 5.1, <math>5.\bar{1}</math></p> <p>(i) After converting all to a common denominator of 105, we have <math>\frac{2}{3} = \frac{70}{105}</math>, <math>\frac{4}{5} = \frac{84}{105}</math>, <math>\frac{4}{7} = \frac{60}{105}</math> so the answer is <math>\frac{4}{7}</math>, <math>\frac{2}{3}</math>, <math>\frac{4}{5}</math></p>
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Answer: 2a. Graph -3, 4.5, -1.1, 5.8 and -5.8 on a number line.



Answer: 2b. Graph  $\frac{1}{2}$ ,  $-\frac{2}{3}$ ,  $3\frac{3}{4}$ ,  $-5\frac{4}{5}$ , and  $6\frac{1}{4}$  on a number line.



<p>3. Absolute value. Remember that the absolute value means the distance from zero. So the absolute value of any number is positive.</p> <p>Thus both <math> 5  = 5</math> and <math> -5  = 5</math>.</p>	<p>True or false:</p> <p>(a) <math>-2 &lt; -3</math>                      (b) <math>-12 \leq -12</math>                      (c) <math>7 \geq -7</math></p> <p>(d) <math>-16 &gt; 14</math>                      (e) <math>3 \leq  -3 </math>                      (f) <math> -5  &lt; 3</math></p> <p>(g) <math> -7  &gt; - 5 </math>                      (h) <math>- -4  &gt;  -3 </math></p>	<p>(a) F (b) T (c) T</p> <p>(d) F (e) T (f) F</p> <p>(g) T (h) F</p>
<p>4. Arithmetic on fractions:</p> <p>multiply and divide</p> <p>add and subtract</p>	<p>Perform the indicated operation. Simplify all fraction answers.</p> <p>(a) <math>\frac{3}{5} + \frac{2}{3}</math>                      (b) <math>-\frac{3}{14} \div \frac{5}{6}</math>                      (c) <math>\frac{5}{9} - \frac{1}{6}</math></p>	<p>(a) <math>\frac{19}{15}</math> or <math>1\frac{4}{15}</math> (b) <math>-\frac{9}{35}</math> (c) <math>\frac{7}{18}</math></p>
<p>5. Arithmetic on signed numbers</p> <p>add and subtract (It's very important to have useful notation in subtraction of signed numbers!)</p> <p>multiply and divide</p>	<p>Perform the indicated operations.</p> <p>(a) <math>-8 + (-3)</math>                      (b) <math>6 + (-9)</math>                      (c) <math>12 - 19</math></p> <p>(d) <math>18 - (-9)</math>                      (e) <math>-23 - (-12)</math></p> <p>(f) <math>4\frac{2}{5} \times (-10)</math>                      (g) <math>-\frac{7}{15} \times \left(-\frac{5}{21}\right)</math>                      (h) <math>34.5 \times (0.001)</math></p> <p>(i) <math>-4.3 - (-2.8)</math>                      (j) <math>4.8 \div (-0.06)</math></p>	<p>(a) <math>-11</math> (b) <math>-3</math> (c) <math>-7</math></p> <p>(d) <math>27</math> (e) <math>-11</math></p> <p>(f) <math>-44</math> (g) <math>\frac{1}{9}</math> (h) <math>0.0345</math></p> <p>(i) <math>-1.5</math> (j) <math>-80</math></p>
<p>6. Positive number exponents</p>	<p>Evaluate each.</p> <p>(a) <math>-7^2</math>                      (b) <math>(-7)^2</math>                      (c) <math>\left(-\frac{4}{5}\right)^3</math>                      (d) <math>(-3.1)^2</math></p>	<p>(a) <math>-49</math> (b) <math>49</math> (c) <math>-\frac{64}{125}</math> (d) <math>9.61</math></p>

<p>7. Order of operations</p> <ul style="list-style-type: none"> <li>• Parentheses.</li> <li>• Exponents</li> <li>• Mult &amp; Div., left to right</li> <li>• Add. &amp; Subt, left to right</li> </ul>	<p>Simplify each.</p> <p>(a) <math>6 - 3[-2 - 3(5 - 7)]</math></p> <p>(b) <math>-6 \times 5 - \frac{19 + 6}{7 - 2}</math></p> <p>(c) <math>2 - 35 \div 5(-3)^2 - 6</math></p>	<p>(a) -6</p> <p>(b) -35</p> <p>(c) -67</p>
<p>8. For numbers, find the Greatest Common Factor and the Least Common Multiple.</p>	<p>(a) Find the LCM of 40 and 72.</p> <p>(b) Find the GCF of 72 and 120.</p>	<p>(a) <math>2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 5 = 360</math></p> <p>(b) <math>2 \cdot 2 \cdot 2 \cdot 3 = 24</math></p>
<p>9. Evaluate an algebraic formula at numerical values.</p>	<p>(a) The formula for volume of a cylinder is <math>V = \pi r^2 h</math>. Find the volume of a cylinder with diameter 10 ft and height 23 ft. Use 3.14 to approximate <math>\pi</math>. (Hint: remember that the diameter is twice the radius.)</p> <p>(b) Evaluate this expression for <math>x = -4</math> and <math>y = 5</math>: <math>3x^2y - 7x - 12y + 8</math></p>	<p>(a) Approximately 1806 cubic feet.</p> <p>(b) 216</p>
<p>10. Identify like terms; combine like terms; use the distributive property; recall how to add and subtract a sequence of terms.</p>	<p>(a) Simplify: <math>16 + 8x - 9 - 6x + 4 + x</math></p> <p>(b) Simplify: <math>3(2 - q) - (8q - 9)</math></p> <p>(c) Simplify <math>(-5x^2 - 8x + 12) - (7 - 6x)</math></p>	<p>(a) <math>3x + 11</math></p> <p>(b) <math>15 - 11q</math></p> <p>(c) <math>-5x^2 - 2x + 5</math></p>

11. Solve linear equations; translate phrases in words to algebraic expressions.	(a) Solve for y: $-8.3 + 2.5y = 12.7$  (b) Solve for p: $\frac{1}{6}p + \frac{1}{3} = \frac{11}{24}$  (c) Write an algebraic expression to represent the phrase "8 less than the quotient of a number and that same number plus 3."	(a) $y = 8.4$  (b) $p = \frac{3}{4}$  (c) $\frac{x}{x+3} - 8$
12. Simplify expressions with exponents.	(a) Simplify: $(2y^2)^4$  (b) Simplify: $\frac{48m^2}{32m^5}$  (c) Simplify: $4p(7p^2 + 8p)$	(a) $16y^8$  (b) $\frac{3}{2m^3}$  (c) $28p^3 + 32p^2$
13. Recognize and solve word problems for which proportions are needed.	(a) A certain van can travel 154 miles on 11 gallons of gas. Under the same conditions, how far can the van travel on a full tank of 21 gallons?  (b) Sam is making a nut mix for a backpacking trip. For every 3 cups of peanuts in the mix, he includes $\frac{1}{2}$ cup of cashews. If he has 21 cups of peanuts, how many cups of cashews must he use?	(a) 294 miles  (b) 3.5 cups of cashews

14. Solve word problems with percentages.	<p>(a) If the sales tax is 6.25%, how much tax will you have to pay on a purchase of \$17.49?</p> <p>(b) Andrea spends \$700 per month on rent. If her take-home pay is \$2258 per month, what percentage of her take-home pay does she pay in rent?</p> <p>(c) Kyle spends \$210 per month on food and miscellaneous supplies. If this is 15% of his take-home pay, how much money does Kyle take home monthly?</p>	<p>(a) (6.25% of \$17.49 is what?) Tax is \$1.09</p> <p>(b) (700 is what Percentage of \$2258?) Percentage: 31%</p> <p>(c) (\$210 is 15% of what?) Monthly take-home pay: \$1400</p>
15. Solve multiple-step linear equations; set up and solve word problems leading to linear equations.	<p>(a) Solve for m: <math>8m - 17 = 4m + 11</math></p> <p>(b) Solve for the variable: <math>3(x - 7) - 2(x - 3) = 45</math></p> <p>(c) Solve, using algebra: If a rectangle has length that is 8 inches more than the width and the perimeter of the rectangle is 60 inches, what are the length and width?</p> <p>(d) Solve, using algebra: If 9 is added to a number and the result is tripled, the result is 42. What is the number?</p>	<p>(a) <math>m = 7</math></p> <p>(b) <math>x = 60</math></p> <p>(c) length = 19 and width = 11</p> <p>(d) The number is 5</p>