

MS Foundations Midterm Review

Name Key

Expressions:

Evaluate using order of operations.

1)  $4 + 2 \times 12 \div 6 - 8 = \boxed{0}$   
 $4 + 24 \div 6 - 8$   
 $4 + 4 - 8$

2)  $9 \div 3 + 6 \times 2 = \boxed{15}$   
 $3 + 6 \cdot 2$   
 $3 + 12$

3)  $3 + 4 - 6 + 2 \times 35 = \boxed{71}$   
 $3 + 4 - 6 + 70$   
 $7 - 6 + 70$

4)  $-2 \cdot 7 + 9 \cdot 5 - 16 \div 8$   
 $-14 + 45 - 2$   
 $\boxed{29}$

5)  $35 - 3(6 - 2)^3$   
 $35 - 3(64)$   
 $\boxed{-157}$

6)  $47 - 5(2 - 4)^3$       7)  $|9 - 14|$   
 $47 - 5(-2)^3$   
 $47 - 5(-8)$   
 $\boxed{87}$

Evaluate for the given value(s).

1)  $-10x^2 + 5y^2$  for  $x = 4$ , and  $y = 8$   
 $-10(16) + 5(64)$   
 $-160 + 320$   
 $\boxed{160}$

2)  $\frac{a+b+c}{c}$  for  $a = -9$ ,  $b = \frac{1}{2}$ , and  $c = 5$   
 $\frac{-9 + \frac{1}{2} + 5}{5} = \frac{-4 + \frac{1}{2}}{5} = \frac{-3.5}{5}$   
 $\boxed{-\frac{7}{10}}$

Fractions:

Perform the indicated operation.

1)  $\frac{2}{7} + \frac{3}{7} = \boxed{\frac{5}{7}}$

2)  $\frac{4}{5} + \frac{1}{2} = \frac{8+5}{10} = \boxed{\frac{13}{10}}$

3)  $\frac{3}{5} - \frac{1}{3} = \frac{9-5}{15} = \boxed{\frac{4}{15}}$

4)  $\frac{2}{11} \cdot \frac{33}{105} = \boxed{\frac{-3}{5}}$

5)  $\frac{1}{6} \cdot \frac{1}{2} = \boxed{\frac{1}{12}}$

6)  $\frac{8}{5} \div \frac{9}{9} = \boxed{\frac{8}{5}}$

7)  $\frac{-12x}{-72} = \boxed{\frac{x}{6}}$

8)  $18 \times 1\frac{1}{2} = \boxed{27}$   
 $18 \cdot \frac{3}{2}$

9)  $4\frac{5}{6} - 1\frac{1}{2} = \boxed{\frac{10}{3}}$   
 $\frac{29}{6} - \frac{3}{2} = \frac{29-9}{6} = \frac{20}{6}$

Integers:

Simplify.

1)  $-2 + -3 - 4 = \boxed{-9}$

2)  $3 - (-2) = \boxed{5}$

3)  $-32 \div -8 = \boxed{4}$

4)  $2(-1)(0)(-3)(-4)(5)(-6)$   
 $\boxed{0}$

5)  $11 - (-2) - 6 + 10$   
 $11 + 2 - 6 + 10$   
 $\boxed{17}$

6)  $6 + (-5) - 14 + 7$   
 $1 - 14 + 7$   
 $\boxed{-6}$

7) It was a very freaky weather day. The temperature started out at  $9^{\circ}\text{C}$  in the morning and went to  $-13^{\circ}\text{C}$  at noon. It stayed at that temperature for six hours and then rose  $7^{\circ}\text{C}$ . How far below the freezing point ( $0^{\circ}\text{C}$ ) was the temperature at 6 p.m.?  $-13+7 = -6^{\circ}$

8) You owe \$225 on your credit card. You make a \$55 payment and then purchase \$87 worth of clothes at Dillard's. What is the integer that represents the balance owed on the credit card?

$$-225 + 55 - 87 = \boxed{\$257}$$

Equations:

Solve each equation. Check your solution.

1)  $35 = 25 + w$   
 $10 = w$

2)  $d + \frac{2}{3} = \frac{11}{5}$   
 $\frac{23}{15}$

3)  $7w = 105$   
 $15$

4)  $\frac{a}{12} = 12$   
 $a = 144$

5)  $10 = \frac{4n}{7}$   
 $10\left(\frac{7}{4}\right) = \frac{35}{2}$

6)  $4x - 12 = 64 + 2x$   
 $2x = 76$   
 $38$

7)  $-10 + 4(3x + 10) = 18$   
 $-10 + 12x + 40 = 18$   
 $30 + 12x = 18$   
 $12x = -12$   
 $x = -1$

8)  $7(6 - x) = 56$   
 $42 - 7x = 56$   
 $-7x = 14$   
 $x = -2$

9)  $2x = -3x + 12 - 2x$   
 $3x = 12$   
 $x = 4$

10) Solve for p:  $3p + 7m = t$   
 $\frac{t-7m}{3}$

11) Solve for y:  $12x - 4y = 20$   
 $-4y = -12x + 20$   
 $y = 3x - 5$

12) Solve for h:  $V = \pi r^2 h$   
 $\frac{V}{\pi r^2}$

Absolute Value:

1)  $|x-6| = 8$   
 $x-6 = 8$  or  $x-6 = -8$   
 $x = 14$  or  $x = -2$

2)  $|-7x+4| = 18$   
 $-7x+4 = 18$  or  $-7x+4 = -18$   
 $-7x = 14$  or  $-7x = -22$   
 $x = -2$  or  $x = \frac{22}{7}$

3)  $5|n+10| = 10$   
 $|n+10| = 2$  or  $|n+10| = -2$   
 $n+10 = 2$  or  $n+10 = -2$   
 $n = -8$  or  $n = -12$

4)  $|1-6n| + 3 = 46$   
 $1-6n = 43$  or  $1-6n = -43$   
 $-6n = 42$  or  $-6n = -44$   
 $n = -7$  or  $n = \frac{22}{3}$

5)  $|x+2| = -8$   
 $\emptyset$

6)  $|-9x| = 64$   
 $-9x = 64$  or  $-9x = -64$   
 $x = -\frac{64}{9}$  or  $x = \frac{64}{9}$

Proportions:

Solve each proportion.

1)  $\frac{4}{9} = \frac{10}{x}$   $4x = 90$   
 $\frac{45}{2}$

2)  $\frac{5}{2} = \frac{6}{x}$   $12 = 5x$   
 $\frac{12}{5}$

3)  $\frac{5}{2} = \frac{2}{x}$   $5x = 4$   
 $x = \frac{4}{5}$

4)  $\frac{h}{108} = \frac{7}{18}$   $18h = 756$   
 $h = 42$

5)  $\frac{45}{792} = \frac{70}{w}$   $45w = 55440$   
 $1232$

6)  $\frac{16}{120} = \frac{j}{15}$   $120j = 240$   
 $j = 2$

7)  $\frac{15}{y} = \frac{40}{12}$   
 $180 = 40y$   
 $y = 4.5$

8)  $\frac{y}{32} = \frac{16}{10}$   
 $10y = 512$   
 $y = 51.2$

9)  $\frac{32.5}{25} = \frac{97.5}{q}$   
 $32.5q = 2437.5$   
 $75$

For each word problem, write and then solve the proportion to find the answer. Be sure to set it up the correct way and show all work.

10) A 380-cubic-centimeter sample of titanium has a mass of 1710 grams. Find the weight of a titanium sample that has a volume of 532 cubic centimeters.

$\frac{380}{1710g} = \frac{532}{x}$   $380x = 909720$   
 $2394g$

11) The Bigtown football team outscored its opponents 5:2 last season. If their opponents scored 38 points, how many points did Bigtown score?

$\frac{5}{2} = \frac{x}{38}$   $190 = 2x$   
 $95 \text{ points}$

12) In a certain desert environment there are a lot of small rodents. There also happen to be a lot of snakes that feed on the rodents. The ratio of rodents to rodent eating snakes is 13 to 3. If there are 4,000 snakes in the area, about how many rodents are there?

$\frac{\text{rodents}}{\text{snakes}} = \frac{13}{3} = \frac{x}{4000}$   
 $3x = 52000$   
 $17333.33$

Inequalities:

Solve each inequality. Graph the solution.

1.)  $3(x - 17) < 15$   
 $3x - 51 < 15$   
 $3x < 66$   
 $x < 22$

2)  $5(x - 11) \geq 14 - 5x$   
 $5x - 55 \geq 14 - 5x$   
 $10x \geq 69$   
 $x \geq 6.9$

3)  $\frac{p}{4} > 15$   
 $-p > 60$   
 $p < -60$

