

Math251

Practice Exam #01

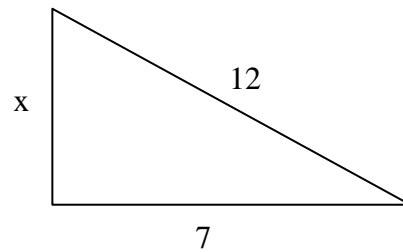
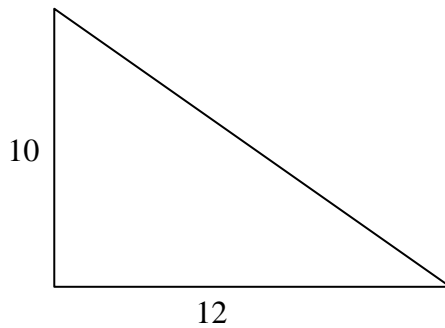
1. Find the value of the exponential expression. **Do not** write your answer as a decimal!

a) $(3^2 - 2^3)^{12}$

b) $- \left(-\frac{2}{3} \right)^2$

c) $- \left[-\frac{3}{2}(7 - (-1)) \right]^2$

2. Use a proportion to find the length of x using the two similar triangles below.



3. Solve the following equations for x.

a) $\frac{x}{2} + \frac{4}{3} = 1 - x$

b) $\frac{2}{3}(x - 1) = \frac{1}{4}(2x + 3)$

4. Find the value of the expression:

$$\frac{-2(3^2 - 5) + 8}{|2 - 5| - |-8|}$$

5. Write out the equation that represents the word statement below. Use x as the unknown number. Then solve the equation for x

If three is added to a number, the result is four less than 12. Find the number.

6. First, write out the equation that represents the word statement below. Use x as the unknown number. Then solve the equation for x .

If three is subtracted from twice a number, the result is four less than the quotient of 72 and 9. Find the number.

7. Decide whether the statement is True or False.

a) $-3^2 - 2^2 < -7 + (-7)$

b) $2[3 - 4(-2)] \geq 23$

8. Select the smaller number.

a) $-|-14|$, $-|-13|$

b) -3.579 , -3.58

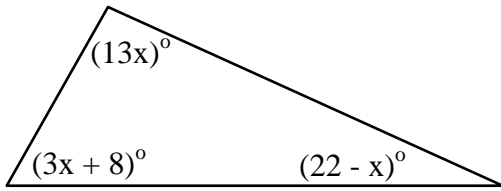
9. Evaluate the expression, given $x = 1$ and $y = -2$.

a) $\frac{3x - 5y}{3 - y}$

b) $\frac{-x + (2y)^2}{2 - x - y}$



10. Find the measures of each marked angle by first writing out an equation and solving it for x . Then label each angle.



11. Solve for x .

a) $\frac{x}{5} = \frac{5}{7}$

b) $\frac{x+2}{3} = \frac{x-3}{4}$



12. How many gallons of 30% antifreeze must be mixed with 40 gallons of 60% antifreeze to get a mixture that is 40% antifreeze? **Complete the table, write out the equation, solve the equation, then clearly indicate your answer.**

	Amount of Solution	% Antifreeze	Amount of Antifreeze
Solution 1	x	.30	
Solution 2			
Final Solution			

13. A collection of 37 coins has a value of \$1.13. The collection contains Nickels and Pennies. Find the number of Nickels and Pennies in the collection. **Complete the table, write out the equation, solve the equation, then clearly indicate the number of pennies and nickels.**

	Number of Coins	Coin Value	Total Coin Value
Nickels	x	0.05	
Pennies			
Total			

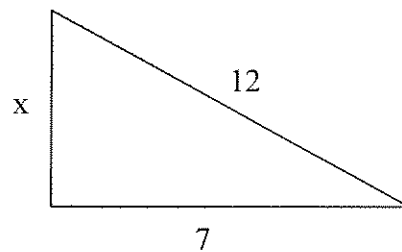
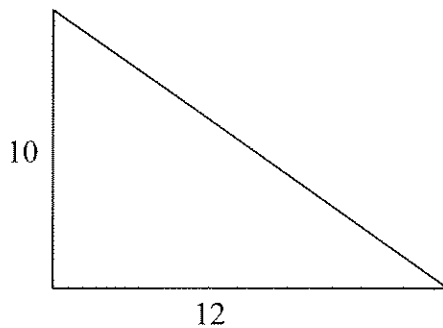
Math251

Practice Exam #01

1. Find the value of the exponential expression. **Do not** write your answer as a decimal!

<p>a) $(3^2 - 2^3)^{12}$</p> <hr/> <p>$(9 - 8)^{12}$</p> <hr/> <p>1^{12}</p> <hr/> <div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">1</div>	<p>b) $-(-\frac{2}{3})^2$</p> <hr/> <p>$-(-\frac{2}{3})(-\frac{2}{3})$</p> <hr/> <p>$-\frac{4}{9}$</p> <hr/> <div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">$-\frac{4}{9}$</div>	<p>c) $-[-\frac{3}{2}(7 - (-1))]^2$</p> <hr/> <p>$-[-\frac{3}{2}(7 + 1)]^2$</p> <hr/> <p>$-[-\frac{3}{2}(8)]^2$</p> <hr/> <p>$-[-12]^2$</p> <hr/> <p>$-[144]$</p> <hr/> <div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">-144</div>
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2. Use a proportion to find the length of x using the two similar triangles below.



$$\frac{x}{10} = \frac{7}{12}$$

$$\frac{12x}{12} = \frac{70}{12}$$

$x = \frac{35}{6}$

$$\frac{x}{7} = \frac{10}{12}$$

$$\frac{x}{7} = \frac{5}{6}$$

$$\frac{6x}{6} = \frac{35}{6}$$

$x = \frac{35}{6}$

3. Solve the following equations for x.

$$\text{a) } \frac{x}{2} + \frac{4}{3} = 1 - x \quad \text{LCD} = 6$$

$$6\left(\frac{x}{2}\right) + 6\left(\frac{4}{3}\right) = 6(1) - 6(x)$$

$$\begin{array}{r} 3x + 8 = 6 - 6x \\ +6x \qquad \qquad +6x \end{array}$$

$$\begin{array}{r} 9x + 8 = 6 \\ -8 \quad -8 \end{array}$$

$$\begin{array}{r} 9x = -2 \\ \frac{9x}{9} = \frac{-2}{9} \end{array}$$

$$\boxed{x = -\frac{2}{9}}$$

$$\text{b) } \frac{2}{3}(x-1) = \frac{1}{4}(2x+3) \quad \text{LCD} = 12$$

$$12\left(\frac{2}{3}\right)(x-1) = 12\left(\frac{1}{4}\right)(2x+3)$$

$$8(x-1) = 3(2x+3)$$

$$\begin{array}{r} 8x - 8 = 6x + 9 \\ -6x \quad -6x \end{array}$$

$$\begin{array}{r} 2x - 8 = 9 \\ +8 \quad +8 \end{array}$$

$$\begin{array}{r} 2x = 17 \\ \frac{2x}{2} = \frac{17}{2} \end{array}$$

$$\boxed{x = \frac{17}{2}}$$

4. Find the value of the expression:

$$\frac{-2(3^2-5)+8}{|2-5|-|-8|}$$

$$\frac{-2(9-5)+8}{|2-5|-8}$$

$$\frac{-2(4)+8}{3-8}$$

$$\frac{-8+8}{-5}$$

$$\frac{0}{-5}$$

$$\boxed{0}$$

5. Write out the equation that represents the word statement below. Use x as the unknown number. Then solve the equation for x

If three is added to a number, the result is four less than 12. Find the number.

$$\boxed{x + 3 = 12 - 4} \quad \text{Equation}$$

$$\begin{array}{r} x + 3 = 8 \\ -3 \quad -3 \\ \hline \end{array}$$

$$\boxed{x = 5}$$

6. First, write out the equation that represents the word statement below. Use x as the unknown number. Then solve the equation for x .

If three is subtracted from twice a number, the result is four less than the quotient of 72 and 9. Find the number.

$$\boxed{2x - 3 = 72 \div 9 - 4} \quad \text{Equation}$$

$$2x - 3 = 8 - 4$$

$$\begin{array}{r} 2x - 3 = 4 \\ +3 \quad +3 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{7}{2}$$

$$\boxed{x = \frac{7}{2}}$$

7. Decide whether the statement is True or False.

a) $-3^2 - 2^2 < -7 + (-7)$

$$-9 - 4 < -7 - 7$$

$$-13 < -14$$

False

b) $2[3 - 4(-2)] \geq 23$

$$2[3 - (-8)] \geq 23$$

$$2[3 + 8] \geq 23$$

$$2[11] \geq 23$$

$$22 \geq 23$$

False

8. Select the smaller number.

a) $-|-14|$, $-|-13|$

Smaller -14 -13

$$-14 < -13$$

b) -3.579 , -3.58

$$-3.579 > -3.580$$

Smaller

9. Evaluate the expression, given $x = 1$ and $y = -2$.

a) $\frac{3x - 5y}{3 - y}$

$$\frac{3(1) - 5(-2)}{3 - (-2)}$$

$$\frac{3 - (-10)}{3 + 2}$$

$$\frac{3 + 10}{5}$$

$$\frac{13}{5}$$

b) $\frac{-x + (2y)^2}{2 - x - y}$

$$\frac{-(1) + [2(-2)]^2}{2 - 1 - (-2)}$$

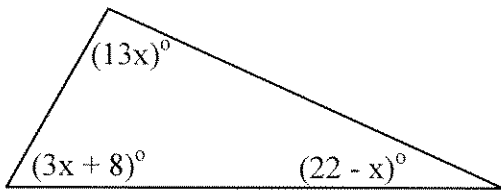
$$\frac{-1 + [-4]^2}{1 - (-2)}$$

$$\frac{-1 + 16}{1 + 2}$$

$$\frac{15}{3}$$

$$5$$

10. Find the measures of each marked angle by first writing out an equation and solving it for x . Then label each angle.



$$13x + (3x + 8) + (22 - x) = 180$$

$$13x + 3x + 8 + 22 - x = 180$$

$$15x + 8 + 22 = 180$$

$$\begin{array}{r} 15x + 30 = 180 \\ -30 \quad -30 \\ \hline \end{array}$$

$$\frac{15x}{15} = \frac{150}{15}$$

11. Solve for x .

a) $\frac{x}{5} = \frac{5}{7}$ *Cross Multiply!*

$$\frac{7x}{7} = \frac{25}{7}$$

$$x = \frac{25}{7}$$

Using LCD = 35 $35\left(\frac{x}{5}\right) = 35\left(\frac{5}{7}\right)$

$$7x = 25$$

$$x = \frac{150}{15}$$

$$x = 10$$

$$13x = 13(10) = 130^\circ$$

$$3x + 8 = 3(10) + 8 = 38^\circ$$

$$22 - x = 22 - 10 = 12^\circ$$

b) $\frac{x+2}{3} = \frac{x-3}{4}$ *Cross Multiply!*

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

$$\begin{array}{r} 4x + 8 = 3x - 9 \\ -8 \quad -8 \\ \hline \end{array}$$

$$\begin{array}{r} 4x = 3x - 17 \\ -3x \quad -3x \\ \hline \end{array}$$

$$x = -17$$

Using LCD = 12 $12\left(\frac{x+2}{3}\right) = 12\left(\frac{x-3}{4}\right)$

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

12. How many gallons of 30% antifreeze must be mixed with 40 gallons of 60% antifreeze to get a mixture that is 40% antifreeze? **Complete the table, write out the equation, solve the equation, then clearly indicate your answer.**

	Amount of Solution	% Antifreeze	Amount of Antifreeze
Solution 1	x	0.30	0.30x
Solution 2	40	0.60	0.60(40)
Final Solution	x+40	0.40	0.40(x+40)

$$0.30x + 0.60(40) = 0.40(x+40)$$

LCD = 10

$$10(0.30)x + 10(0.60)(40) = 10(0.40)(x+40)$$

$$3x + 6(40) = 4(x+40)$$

$$\begin{aligned} 3x + 240 &= 4x + 160 \\ -240 &\quad -240 \\ \hline 3x &= 4x - 80 \\ -4x &\quad -4x \\ \hline -x &= -80 \\ -1 &\quad -1 \\ \hline x &= 80 \text{ gal} \end{aligned}$$

13. A collection of 37 coins has a value of \$1.13. The collection contains Nickels and Pennies. Find the number of Nickels and Pennies in the collection. **Complete the table, write out the equation, solve the equation, then clearly indicate the number of pennies and nickels.**

	Number of Coins	Coin Value	Total Coin Value
Nickels	x	0.05	0.05x
Pennies	37-x	0.01	0.01(37-x)
Total			1.13

$$0.05x + 0.01(37-x) = 1.13$$

LCD = 100

$$100(0.05)x + 100(0.01)(37-x) = 100(1.13)$$

$$5x + 1(37-x) = 113$$

$$5x + 37 - x = 113$$

$$\begin{aligned} 4x + 37 &= 113 \\ -37 &\quad -37 \\ \hline 4x &= 76 \end{aligned}$$

$$\frac{4x}{4} = \frac{76}{4}$$

$$\begin{aligned} x &= 19 \text{ Nickels} \\ 37-x &= 18 \text{ Pennies} \end{aligned}$$