Task #1:

Match the property name with the appropriate equation.

1. Commutative property of addition a. $r\left(s+t\right)=rs+rt$
2. Commutative property of multiplication b. $x ∙ \frac{1}{x}=1$
3. Associative property of addition c. $-y+x=x+(-y)$
4. Associative property of multiplication d. $\frac{a}{b}+ \frac{-a}{b}=0$
5. Identity property of addition e. $y ∙\left(zx\right)=\left(yz\right)∙x$
6. Identity property of multiplication f. $1 ∙\left(xy\right)=xy$
7. Inverse property of addition g. $d∙0=0 and 0 ∙d=0$
8. Inverse property of multiplication h. $x+(b+c)=\left(x+b\right)+c$
9. Distributive property i. $y+0=y$
10. Property of zero for multiplication j. $p∙q=q∙p$

Task #2:

Suppose you are a math teacher and you have just taught a lesson on exponents. A student asks you to review some worked problems. Look over the problems and correct any mistakes. Explain the errors in the student’s reasoning.

1. $\frac{4a^{2}b^{5}}{2a^{6}b^{2}}$ = $ \frac{4}{2} ∙ \frac{a^{2}}{a^{6}} ∙\frac{b^{5}}{b^{2}}$

 = 2 $∙ a^{4 }∙b^{3}$

 = 2$a^{4}b^{3}$

1. $\frac{y^{2}}{y^{7 }} $= $ y^{-14}$

 =$ \frac{1}{y^{14}}$

1. $\frac{-12k^{2}m^{3}n}{9m^{3}n^{6}k^{5}}$ = $\frac{-12}{9 }$ $∙ \frac{k^{2}}{k^{5}}$ $∙ \frac{m^{3}}{m^{3}} ∙ \frac{n^{6}}{n}$

 = $\frac{-4 }{3}∙ k^{-3}∙m^{3}∙n^{5}$

 = $\frac{-4m^{3}n^{5}}{k^{3}}$

1. $2x^{2}y ∙ 3x^{5}y^{2} $= $\left(2∙3\right)\left(x^{2}∙x^{5}\right)(y∙y^{2})$

 = $6x^{10}y^{2}$

1. $(3x^{2})^{3}∙2x^{4}$ = $3x^{8 }∙2x^{4}$

 = $6x^{32}$

Task #3: Decide whether each of the following pairs of expressions or equations are equivalent. If they are, show how you can be sure. If they are not, justify your reasoning completely.

1. (ab)2 and a2b2 d. 3x – 4y = 12 and y = $\frac{3}{4}$ x - 3
2. y = 2(x-1) + 3 and y = 2x+1 e. (a + b)2 and a2 + b2
3. $\frac{x^{6}}{x^{2} } $and x3 f. y = 3(x-5) + 2 and y = 2x - 8

Task #4:

Use grouping to factor. 20ay – 10ax + 2by – bx.

Task #5: Factor.

1. 3a2b2 – 6a2b
2. 8x2 – 53x – 21
3. 25z2 + 30z + 9
4. 4x2 + 9
5. 125x3 – 8
6. 2ax – 6bx + ay – 3by
7. a6 – b6

Task #6: Factor.

1. rs + 4st
2. 6x2 + 7x – 20
3. 4x2 – 20x + 25
4. x2 + 25
5. 64x3 + 27
6. 5x3 + 10x2 – 20x – 40
7. y2 – x2 + 8y + 16

Task #7: Write a detailed step-by-step solution that you could present to the class for each rational expression or equation shown.

1. $\frac{y+3}{4-y^{2}}+\frac{1}{y-2}$ b. $\frac{5x^{2}}{y^{2}-36}÷\frac{25xy-25}{y^{2}-7y+6}$

Task #8:

Write out a step by step solution to simplify the complex fractions.

1. $\frac{ab-\frac{1}{a}}{\frac{1}{a^{2}b}}$ b. $\frac{\frac{1}{a+2}-\frac{1}{a-2}}{\frac{-2}{a-2}}$