Name: KEY
Quiz 1 :: Math 111 :: September 4, 2015

---

1. Simplify each expression, elimating any negative exponents

(a)

$(3a^3b^3)^2(2ab^2)$

$9a^6b^6 \cdot 2ab^2$

$18a^7b^8$

(b)

$\sqrt[3]{\frac{27}{x^{-6}}} = 3\cdot(x^6)^{1/3} = 3x^2$

$3x^2$

(c)

$\left(\frac{3x^{-3/2}y^3}{x^2y^{1/2}}\right)^{-2}$ $\left(\frac{x^2y^{1/2}x^{3/2}}{3y^3}\right)^2$ $\frac{x^4x^3y}{3y^6}$

$\frac{x^7}{3y^5}$

2. Perform the indicated operations and simplify

(a)

$(x+y)^2 - x^2 - y^2$

$2xy$

(b)

$(\sqrt{a}+\sqrt{b})(\sqrt{a}-\sqrt{b})$

$a-b$

(c)

$\underbrace{(ab)^2 - a^2b^2}_{=0} + \left(\frac{a}{b}\right)^2 + \frac{a^2}{b^2}$

$\frac{2a^2}{b^2}$

(d)

$\sqrt{4x^2+4y^2} - x - y$

$2\sqrt{x^2+y^2} - x - y$

3. Factor each expression completely

(a) $36 - 9y^2$ $(6-3y)$ $(6-3y)(6+3y)$

(b) $3x^2 + 3x - 18$ $(3x+9)(x-2)$ $(3x+9)(x-2)$

(c) $x^5 + x^4 + x + 1$ $x^4(x+1) + (x+1)$ $(x+1)(x^4+1)$

(d) $3x(x+1)^{5/4} - x^2(x+1)^{1/4}$ $x(x+1)^{1/4}\left(3(x+1) - x\right)$ $3x+1-x$ $x(x+1)^{\frac{1}{4}}(2x+1)$

(e) $x^3y - 4xy$ $xy(x^2-4)$ $xy(x-2)(x+2)$

4. Simplify the rational expression

(a) $\dfrac{\frac{3}{x+1}}{\frac{x+1}{x+1} - \frac{1}{x+1}}$ $\dfrac{3}{x}$ $\dfrac{3}{\frac{x}{x+1}}$ $\dfrac{3(x+1)}{x}$

(b) $\dfrac{x+4}{(x+4)}\dfrac{2}{x+3} - \dfrac{1}{x^2+7x+12}$ $= \dfrac{2x+8-1}{\sim}$ $\dfrac{2x+7}{x^2+7x+12}$

(c) $\dfrac{y^2 - \frac{x}{y^2}x}{\frac{1}{y} - \frac{1}{x}}$ $\dfrac{y^4 - x^2}{\frac{xy^2}{x-y}}$ $\dfrac{y^4-x^2}{y(x-y)}$