Math 114
Midterm 2 Review

[1]   Write in scientific notation.

    [a]   10,000,000,000   [b]   238,000,000   [c]   0.000000032

[2]   Write in standard notation.

    [a] 4.12×10^{-6} [b] 9.27×10^{5}

[3]   Simplify.

    [a] $(b^3)^7$ [b] $g^5 g^7$ [c] $\dfrac{k^{13}}{k^5}$

[4]   Simplify. (Your answer should use only positive exponents.)

    [a] m^{-6} [b] $r^{-5} s^3$ [c] $3v^{-7}$

[5]   Write using fractional and/or negative exponents, and simplify.

    [a] $\sqrt[5]{j^8}$ [b] $\left(\sqrt[4]{e}\right)^{11}$ [c] $\sqrt{w^5}$

    [d] $\left(\sqrt{f}\right)^9$ [e] $\sqrt[7]{z}$ [f] $\left(\dfrac{1}{\sqrt{u}}\right)^5$

[6]   Simplify. You may write your answers using either radicals or fractional exponents.

    [a] $\sqrt{98}$ [b] $\sqrt{108}$ [c] $\sqrt{q^{14}}$

    [d] $\sqrt[6]{h^{24}}$ [e] $\left(c^{\frac{2}{3}}\right)^{\frac{6}{5}}$ [f] $t^{\frac{2}{5}} t^{\frac{1}{3}}$

    [g] $\dfrac{a^{\frac{2}{3}}}{a^{\frac{1}{5}}}$ [h] $\left(49 y^{-6}\right)^{\frac{1}{2}}$ [i] $\left(d^{\frac{5}{6}} j^{-\frac{3}{4}}\right)^{-\frac{2}{15}}$

    [j] $\left(\dfrac{b^{-\frac{3}{4}} g^{\frac{1}{3}}}{k^{\frac{2}{9}}}\right)^{\frac{6}{5}}$ [k] $5\sqrt{7} + 8\sqrt{7}$ [l] $2\sqrt{6} - 7\sqrt{6}$

    [m] $\sqrt{108} - \sqrt{48}$ [n] $\sqrt{50x^7} - 3x\sqrt{8x^5}$ [o] $\sqrt{30}\sqrt{18}$

[p] $m^6 m^{\frac{2}{3}}$ [q] $r^{\frac{3}{4}} r$ [r] $\sqrt{3}\left(4\sqrt{3} - \sqrt{6}\right)$

[7]   Rationalize the denominator, and simplify.

[a] $\dfrac{1}{3\sqrt{5}}$ [b] $\dfrac{4}{7\sqrt{6}}$ [c] $\dfrac{6}{\sqrt{7}+3}$

[8]   Divide. Rationalize the denominator and simplify, if possible.

[a] $\dfrac{\sqrt{72}}{\sqrt{9}}$ [b] $\dfrac{\sqrt{5}}{\sqrt{60}}$

[9]   Divide. Write your answer using fractional exponents.

[a] $\dfrac{s^2}{\sqrt[4]{s}}$ [b] $\dfrac{\sqrt[3]{v}}{\sqrt[5]{v}}$

[10]   Solve. Check your answers for full credit.

[a] $\sqrt[3]{j} = 3$ [b] $\sqrt[5]{6u - 9} = \sqrt[5]{5 - u}$

[c] $\sqrt{4f - 7} = 11$ [d] $4 + 3\sqrt{w} = 13$

[e] $17 - 2\sqrt{1 - 3z} = 9$ [f] $q + \sqrt{q + 11} = 1$

[11]   Simplify. Write your answers using radicals.

[a] $\sqrt{72h^7}$ [b] $\sqrt{20c^8 t^{11} y^6}$ [c] $\sqrt{20a^7}\sqrt{15a^8}$

[d] $\left(5 - \sqrt{3y}\right)\left(5 + \sqrt{3y}\right)$ [e] $\dfrac{\sqrt{3}}{\sqrt{64d^6 j}}$

[12]   Find the distance between the points $(-2,7)$ and $(-5,-2)$.

[13]   Solve, and round your answer to 3 decimal points.

[a]   If the length of a golden rectangle is 15, find its width.
[b]   If the width of a golden rectangle is 18, find its length.
[c]   If the length of a leg of a right angle triangle is 7 inches, and the length of the hypoteneuse is 9 inches, find the length of the other leg.
[d]   If the length of the legs of a right angle triangle are 5 inches and 11 inches, find the length of the hypoteneuse.