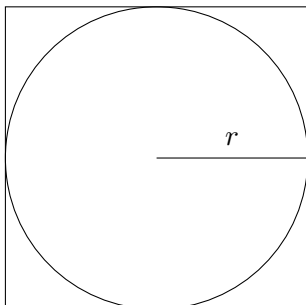Math 29
PAL Worksheet 13

1. A circle of radius r is inscribed in a square.

    a. Write a function that gives the area of the square as a function of r.

    b. Write a function that gives the perimeter of the square as a function of r.

    c. Write a function that gives the area outside the circle but inside the square as a function of r.

2. Simplify each expression. You should have no negative exponents, and no compound fractions in your answers. You may assume variables represent nonnegative numbers.

    a. $\dfrac{\sqrt[5]{32^{-2}}}{\sqrt[4]{81^3}}$

    b. $\dfrac{(2+3)^{-1}}{2^{-1}+3^{-1}}$

    c. $\dfrac{3^{-1}+4^{-1}}{12^{-1}}$

    d. $\dfrac{\sqrt{27x^{-3}}}{\sqrt[4]{9x^2}}$

    e. $(a^{-2}+b^{-2})^{-1}$

    f. $\dfrac{(x^2 y^{\frac{1}{3}})^6}{(x^{-2}y^{\frac{1}{2}})^2}$

    g. $\dfrac{(16x^2 y^{-\frac{1}{3}})^{\frac{3}{4}}}{(4x^{-1}y^{\frac{1}{3}})^{\frac{3}{2}}}$

    h. $\dfrac{\sqrt{(x+y)^3}\sqrt[4]{x^3 y^{-5}}}{(x\sqrt{x^{-3}y})^{-2}}$

3. Solve for x:

    a. $2^{x^2-x}=4$

    b. $\dfrac{5^{x^2}\cdot 5^x}{5^8}=5^4$

    c. $16^{3x-1}=32^{x-4}$

    d. $(\sqrt{3})^x \cdot 9^{x-1}\cdot 3^{2x+1}=81$

    e. $\dfrac{9^{x^2}}{81\cdot 3^x}=9$