Pre-Calculus: Algebra Review Name: _____

1.) Evaluate if x = -2 and y = 3:

a.) $-2x+xy$

$-2(-2) + (-2)(3)$

$4 + -6 = \boxed{-2}$

b.) $\frac{3x+2y}{2+y}$ $\frac{3(-2)+2(3)}{2+3}$

$\frac{-6+6}{5} = \frac{0}{5} = \boxed{0}$

2.) Determine the domain of each expression:

a.) $\frac{4}{x-5} = 0$

$+5 \quad +5$

$x \neq 5$

Domain: All reals except $x = 5$

b.) $\frac{x^2+1}{x} = 0$

Domain: All reals except $x = 0$

c.) $\frac{x^3}{x-1} = 0$

$+1 \quad +1$

$x \neq 1$

Domain: All reals except $x = 1$

3.) List every category (natural, integer, rational, irrational, and real) to which each number belongs:

a.) -12.3 real rational

b.) -11 real integer rational

c.) $-\sqrt{2}$ real Irrational

d.) $\frac{3}{4}$ real rational

e.) 4.666666 real rational

f.) $4.0\overline{7}$ real rational

4.) Evaluate **without a calculator**:

a.) -4^2 -16

b.) $(-4)^2$ 16

c.) $\sqrt{(-7)^2}$ 7

d.) $3^{-6} \cdot 3^4$ $3^{-2} = \frac{1}{3^2} = \frac{1}{9}$

5.) Simplify each expression. Express the answer so that all exponents are positive.

a.) $(8x^3)^2$ $8^2(x^3)^2$ $\boxed{64x^6}$

b.) $(x^2y^{-1})^2$ $(x^2)^2(y^{-1})^2$ x^4y^{-2} $\boxed{\frac{x^4}{y^2}}$

c.) $\frac{x^7y^3}{xy^4}$ $\boxed{\frac{x}{y}}$

d.) $\left(\frac{3x^{-1}}{4y^{-1}}\right)^{-2}$ $\frac{3^{-2}x^2}{4^{-2}y^2}$ $\frac{4^2x^2}{3^2y^2} = \boxed{\frac{16x^2}{9y^2}}$

6.) Prove that the following side lengths create (or don't create) a right triangle: 4,5,7.

$4^2 + 5^2 \stackrel{?}{=} 7^2$

$16 + 25 \stackrel{?}{=} 49$

$41 \neq 49$

$\boxed{\text{NO right } \Delta}$

7.) Find the circumference (C) and area (A) of a circle with a radius of 5 meters.

$C = 2\pi(5) = 10\pi m \approx 31.4 m$

$A = \pi(5)^2 = 25\pi m^2 \approx 78.5 m^2$

8.) Find the volume (V) and surface area (S) of sphere with a radius of 4 centimeters.

$V = \frac{4\pi r^3}{3} = \frac{4\pi(4)^3}{3} = \frac{256\pi}{3}$ $= 85.3\pi\ cm^3$ $\approx 268.1\ cm^3$

$SA = 4\pi r^2 = 4\pi(4)^2 = 64\pi\ cm^2 \approx 201.1\ cm^2$

9.) Find the area of the shaded region:

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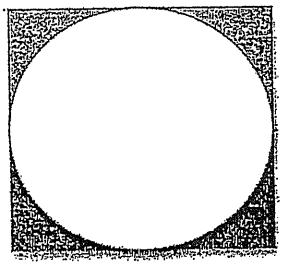
$(6)(6) - \pi(3)^2$

$36 - 9\pi = 7.73\ cm^2$



6 cm

6 cm

10.) A circular swimming pool is 20 feet in diameter and is enclosed by a wooden deck that is three feet wide.

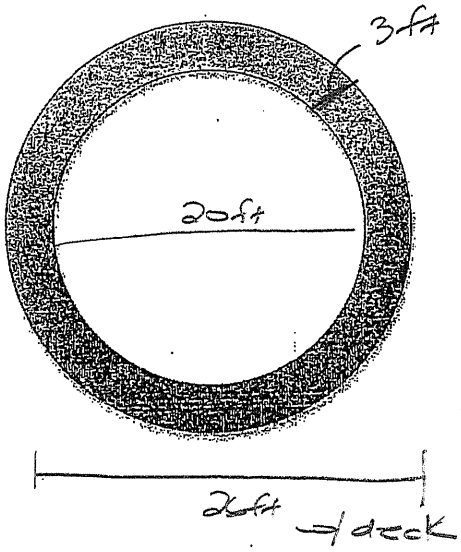
a.) What is the area of the deck?

$\pi(13)^2 - \pi(10)^2$

$169\pi - 100\pi = 69\pi\ ft^2 \approx 216.8\ ft^2$

b.) How much fence is required to enclose the deck?

$\pi(26) = 26\pi$ or $81.7\ ft$



11.) Add, subtract, or multiply. Express your answer as a single polynomial in standard form.

a.) $(x^2-3x+1)+2(3x^2+x-4)$

$x^2-3x+1+6x^2+2x-8$

$7x^2-1x-7$

b.) $(3x+1)(2x+1)$

$6x^2+3x+2x+1$

$6x^2+5x+1$

c.) $(-x-2)(-2x-4)$

$2x^2+4x+4x+8$

$2x^2+8x+8$

d.) $(2x-3)(x^2+x+1)$

	x^2	x	1
$2x$	$2x^3$	$2x^2$	$2x$
-3	$-3x^2$	$-3x$	-3

$2x^3-1x^2-1x-3$

e.) $(3x+2)(3x-2)$

$9x^2-6x+6x-4$

$9x^2-4$

f.) $(x-2)^3$

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

$(x-2)(x^2-4x+4)$

$x^3-4x^2+4x-2x^2+8x-8$

$x^3-6x^2+12x-8$