

Name \_\_\_\_\_

## BLC190- ATF-F2018 Homework 3 with Quiz Preparation

1. Composite Functions: [These answers are very simple.]

Given:  $f(x) = x - 2$        $g(x) = x + 2$

a. Find  $f(g(x))$

$=x$

b. Find  $g(f(x))$

Given:  $f(x) = x^2$        $g(x) = x^{1/2}$

$=x$

2. Simplify the following... [There is a consistency to the answers.]

<p>a. <math>\frac{t^6 r^9}{(tr)^6 (r^3)}</math></p> <p style="text-align: center;"><math>=1</math></p>	<p>b. <math>\frac{(x^{1/3})^2}{x^{4/6}}</math></p> <p style="text-align: center;"><math>=1</math></p>	<p>c. <math>\frac{x^5 (x^2 y^4)^5}{x^{15} y^{20}}</math></p> <p style="text-align: center;"><math>=1</math></p>
<p>d. <math>\frac{[\sqrt{(x^3 y^4)}]^3}{(x^{3/2})^3 (y^6)}</math></p> <p style="text-align: center;"><math>=1</math></p>	<p>e. <math>\left\{ \frac{(x^3 y^4)^{0.5}}{y(x^{1.5})(y)} \right\}^\pi</math></p> <p style="text-align: center;"><math>=1</math></p>	<p>f. <math>\left\{ \frac{\pi^6 e^9 r^\pi}{(\pi e)^6 (e^3)} (az)^{0.43} \right\}^0</math></p> <p style="text-align: center;"><math>=1</math></p>

3. Evaluate the following: [3a. and 3b. **don't** share the same answer.]

<p>a. <math>\frac{(\sqrt{243})^{1/5}}{\sqrt[3]{27}(0.5)} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}</math></p>	<p>b. <math>\frac{(\sqrt[3]{117649})(7^{-2})}{\frac{e^0}{2}} = 2</math></p>
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4. Ballpark the following: Don't use a calculator. Just use your head ... and a pencil. Show your pencil work. [No patterns in this set.] E.g.  $3^{2.5} = 3^2 \cdot 3^{0.5} \approx 9 \cdot 1.7 = 15.3$ . This is extremely good practice.

a. $9^{2.5} = 243$	b. $81^{1.25} = 243$	c. $3^{-\pi} \approx 1/31$ or so
d. $16^{1.5} = 64$	e. $16^{1.75} = 128$	f. $16^{-1.6} \approx 1/90$ or so

5. Solve for the variable: [There is a pattern to the answers.]

a. $\frac{1}{x^3} = \frac{1}{8}$  $x=2$	b. $x^{-5} = \frac{1}{32}$  $x=2$	c. $\frac{x^{221}}{x^{223}} = \frac{1}{4}$  $x=2$
c. $(x^2)^{-3} = 0.04$  $x=25$	d. $(x^{0.5})^3 = 125$  $x=25$	e. $(100^{-1/2})\left(\frac{1}{x^{-1/2}}\right)^3 = 12.5$  $x=25$
f. $\pi\sqrt{x} = \sqrt{x^3}$  $x = \pi$	g. $\frac{\pi^2}{x^{-2}} = \frac{x^3}{\pi^{-1}}$  $x = \pi$	h. $x^{2.5} = \frac{31.04373177842557}{\sqrt{x}}$  $x \approx \pi$

6. Find all solutions for the following: (Round your answers to the nearest 100<sup>th</sup> ..... 2 decimal places.)

a. $x^2 - 10x + 21 = 0$  $x = 3, 7$	b. $x^{2/5} - 10x^{1/5} + 20 = -1$  $x = 243, 16,807$  partial answer: 16,807	c. $x^{2/\pi} - 10x^{1/\pi} = -21$  $x = 3^\pi, 7^\pi \approx 31.54, 451.81$  partial answer: 451.81
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7. Now try this. Solve the following for y:  $220 = 10^y$

If you can't figure it out... at least estimate an answer.