ALGEBRA/TRIGONOMETRY QUIZ

1. Divide u^3 by $u+1$.
2. Simplify: $\left(\dfrac{-5b^y}{3^2x^5}\right)^3\left(\dfrac{3x^7}{5b^y}\right)^2$.
3. Evaluate $8^{2/3}$.
4. Evaluate $25^{3/2}$.
5. Simplify $5\sqrt{12}+3\sqrt{75}$, if possible, to an expression with only one root sign.
6. Combine to a single fraction with a common factored denominator:

$$\frac{2x}{x^2-6x+9}-\frac{8}{x^2-2x-3}-\frac{1}{x+1}$$

In problems 7 - 9, complete the square and write as a sum or difference of two squares.

7. x^2-x+1
8. x^2+3x
9. x^2-7
10. Combine and simplify: $1+\dfrac{1}{1+\dfrac{1}{1-x}}$
11. Simplify: $\dfrac{\dfrac{1}{x-1}-\dfrac{1}{x-2}}{\dfrac{1}{x-2}-\dfrac{1}{x-3}}$.
12. Simplify $a^{[3\log_a b+2\log_a c]}$ to a form *without* any logs, i.e., just variables raised to a power.
13. Choose the correct answer: $\log\frac{a}{b}$ equals

    a) $\dfrac{\log a}{\log b}$

    b) $\log a-\log b$

    c) $\dfrac{\log a}{b}$

    d) $a\log\frac{1}{b}$

    e) none of the others, but _____.
14. Find the roots of $x^2-3x-10=0$.

15. Find the roots of $3x^2 + 5x = 0$.

16. Solve (for x) $\dfrac{x}{x-2} + \dfrac{x-1}{2} = x + 1$.

17. Solve for x and y.

$$\begin{aligned} 2x + y &= 6 \\ 4x + 2y &= 8 \end{aligned}$$

18. Solve for x, y and z.

$$\begin{aligned} 3x + 4y - z &= -2 \\ 2x - 3y + z &= 4 \\ x - 6y + 2z &= 5 \end{aligned}$$

19. True or False?: $\sqrt{a^2 + b^2} = a + b$.

20. Given $\sin\alpha = 5/13$. what is $\cot\alpha$?

21. True or False? $\cos^4\beta - \sin^4\beta = 1 - 2\sin^2\beta$.

22. Given $\sin\theta = x$, what is $\cos\theta$?

23. True or False? $\sin 2x = 2\sin x$?

24. Given $\sin\alpha = 4/5$, what is $\sin 2\alpha$.?

25. True or False? $1 + \sin 2x = (\sin x + \cos x)^2$.

26. Simplify: $\sin^4 x + 2\sin^2 x\cos^2 x + \cos^4 x + 2$.

In problems 27 and 28, re-write in terms of $\sin x$, $\cos x$ only.

27. $$\frac{\csc x \tan^2 x}{\sec x}$$

28. $$\frac{\sin x \cot x}{\sec x}$$

29. Calculate the area of a circle, given that the circumference equals 10π.

30. Calculate the area of a right triangle, with one side equaling 3 and the hypotenuse equaling 5.