ALGEBRA 2/TRIGONOMETRY MIDTERM REVIEW – SPRING 2011

1. Write $(2x+1)^2-(x+2)^2$ in simplest form.
2. The solution of $x^2-5x=6$ is...
3. Write $\dfrac{a-\dfrac{1}{a}}{a+1}$ in simplest form.
4. The sum of $\left(3+\sqrt{12}\right)$ and $\left(-5+\sqrt{27}\right)$ is...
5. Which of the following products is rational?
   a. $\left(10+\sqrt{10}\right)\left(10+\sqrt{10}\right)$ b. $\left(10+\sqrt{10}\right)\left(10-\sqrt{10}\right)$ c. $\sqrt{10}\left(2+\sqrt{10}\right)$ d. $10\left(10-\sqrt{10}\right)$
6. Rationalize $\dfrac{1-\sqrt{3}}{1+\sqrt{3}}$.
7. Which of the following is a one-to-one function when the domain is all real numbers?
   a. $y=x-5$ b. $x^2+y^2=9$ c. $y=x^2-2x+5$ d. $y=|x-4|$
8. Find the roots of the equation $2x^2-5x+3=0$.
9. Write the expression $2\log a+\dfrac{1}{3}\log b$ as a single logarithmic expression.
10. Express the product $(3-2i)(-1+i)$ in $a+bi$ form.
11. Find the solution set of $|2x-4|<3$.
12. Solve for x: $3+(x+3)^{\frac{1}{2}}=x$.
13. Write the equation of a circle if the center is $C(2,1)$ and one point on the circle is $A(4,0)$.
14. Find the roots of $x^2+4x=6$.
15. Let $f(x)=x^2-x$ and $g(x)=5x+7$.
    a. Find $(f\circ g)(-2)$.
    b. Write $(f\circ g)(x)$ in simplest form.
16. Find reference angles.
    a. 107° b. -150° c. 408° d. 291°
17. The point $(9,-13)$ is on the terminal side of angle θ. Find:
    a. $\sin\theta$ b. $\cos\theta$ c. $\tan\theta$ d. $\csc\theta$ e. $\sec\theta$ f. $\cot\theta$
18. Find each exact function value. (In rational or radical form. NO ROUNDING.)
    a. $\sin\dfrac{\pi}{4}$ b. $\cos\dfrac{\pi}{6}$ c. $\tan 120°$ d. $\csc 120°$
19. From the top of a building that is 56 feet high, the angle of depression to the base of an adjacent building is 72°. Find, to the nearest foot, the distance between the buildings.
20. Let $0\le\theta<2\pi$. For what two values of θ is each function value undefined?
    a. $\tan\theta$ b. $\csc\theta$ c. $\sec\theta$ d. $\cot\theta$