

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 $\frac{a - \frac{1}{a}}{a + 1}$ in simplest form.
4. The sum of $(3 + \sqrt{12})$ and $(-5 + \sqrt{27})$ is...
5. Which of the following products is rational?
a. $(10 + \sqrt{10})(10 + \sqrt{10})$ b. $(10 + \sqrt{10})(10 - \sqrt{10})$ c. $\sqrt{10}(2 + \sqrt{10})$ d. $10(10 - \sqrt{10})$
6. Rationalize $\frac{1 - \sqrt{3}}{1 + \sqrt{3}}$.
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 $2 \log a + \frac{1}{3} \log b$ 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. $\sin \frac{\pi}{4}$ b. $\cos \frac{\pi}{6}$ c. $\tan 120^\circ$ d. $\csc 120^\circ$
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 $0 \leq \theta < 2\pi$. For what two values of θ is each function value undefined?
a. $\tan \theta$ b. $\csc \theta$ c. $\sec \theta$ d. $\cot \theta$