AP Calc Are you ready for Calculus – No calculator Name: __________

1. Expand $(x + 2y)^3$.

2. Find the sum and the product of the roots (real and complex) of $x^3 + 3x^2 + 7x - 11 = 0$.

3. Solve for x: $\frac{3}{x-2}+\frac{2}{x+2}=\frac{5}{x^2-4}$

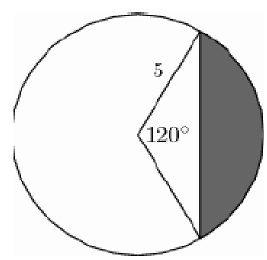
4. If Richard can paint their living room in 4 hours, and Vanessa can paint the same living room in 5 hours, then how long will it take them to paint the living room working together?

5. Determine the sum of the infinite geometric series with first term 3 and common ratio $\frac{2}{5}$.

6. Compute $\log_9 27$.

7. Factor completely $x^6 - 1$ over the real numbers.

8. Find the area of the shaded region below (lying inside a circle of radius 5)



9. Find the equation of the line passing through the points (2, 3) and (5,-1).

10. Find the area of the region bordered by the lines $4x + 7y = 14$, $x = 1$, and $y = -2$.

11. Sketch the graph of the equation $x^2 + y^2 + 2x + 4y = 11$:

12. Evaluate the following quantities:

(a) $\sin \frac{\pi}{6}$ (b) $\cos \frac{\pi}{2}$ (c) $\tan \frac{5\pi}{4}$

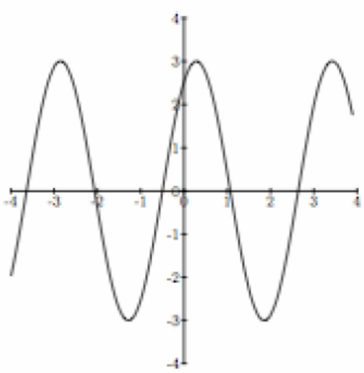
13. Find all with θ with $0 \le \theta \le 2\pi$ such that: $(\sin\theta + \cos\theta)^2 = 1.5$

14. Sketch the graph of $y = 3\sin(2x + 1)$.

15. Simplify $\left(\cos\frac{\pi}{12}+i\sin\frac{\pi}{12}\right)^9$

Don't look at the next page until you've attempted all the problems!

Answer

1. $x^3 + 6x^2y + 12xy^2 + 8y^3$
2. Sum: -3, Product: 11
3. $x = \frac{3}{5}$
4. $\frac{20}{9}$ hours
5. 5
6. $\frac{3}{2}$
7. $(x-1)(x+1)(x^2+x+1)(x^2-x+1)$
8. $\frac{25}{3}\pi - \frac{25\sqrt{3}}{4}$
9. $(y-3) = -\frac{4}{3}(x-2)$ or $y = -\frac{4}{3}x + \frac{17}{3}$ or $4x + 3y = 17$ or equivalent
10. $\frac{72}{7}$
11. Circle with center $(-1, -2)$ and radius 4
12. (a) $\frac{1}{2}$ (b) 0 (c) 1
13. $\theta \in \left\{\frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}\right\}$
14. 

The key features are passing through $\left(-\frac{1}{2}, 0\right)$, crossing the x-axis at periods of every $\pi/2$, and having an amplitude (height) of 3.

15. $-\frac{\sqrt{2}}{2} + i\frac{\sqrt{2}}{2}$