Pre-Calculus – Unit 1   Name _____

WS-1: Angles and Angle Measures

Part 1 – Give the reference angle for each.

1. $150°$ _____   2. $225°$ _____   3. $300°$ _____

4. $240°$ _____   5. $140°$ _____   6. $-20°$ _____

7. $95°$ _____   8. $220°$ _____   9. $260°$ _____

10. $278°$ _____   11. $351°$ _____   12. $500°$ _____

13. $390°$ _____   14. $700°$ _____   15. $-150°$ _____

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Part 2 – Convert to the other unit of measure (degree or radian). Show your work!

1. $60°$ _____   2. $80°$ _____   3. $405°$ _____

4. $\dfrac{5\pi}{6}$ _____   5. $\dfrac{7\pi}{3}$ _____   6. 2 _____

7. $-45°$ _____   8. $-\dfrac{\pi}{9}$ _____   9. $100°$ _____

10. $-25°$ _____   11. $\dfrac{3\pi}{5}$ _____   12. $-\dfrac{2\pi}{5}$ _____

13. $600°$ _____   14. $\dfrac{8\pi}{9}$ _____   15. 3 _____

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Part 3 – Indicate which quadrant each angle is in.

1. $397°$ _____   2. $275°$ _____   3. $\dfrac{\pi}{3}$ _____

4. $-32°$ _____   5. $\dfrac{5\pi}{9}$ _____   6. $-\dfrac{12\pi}{5}$ _____

7. $945°$ _____   8. $\dfrac{11\pi}{3}$ _____   9. $-100°$ _____

10. $400°$ _____   11. $\dfrac{7\pi}{9}$ _____   12. $\dfrac{2\pi}{7}$ _____

13. $\dfrac{19\pi}{10}$ _____   14. $840°$ _____   15. $\dfrac{-3\pi}{5}$ _____

Coterminal and Reference Angles

Given the following angles, do the following:

    a) Find the coterminal angle θ that is between $0°$ and $360°$ or 0 and 2π
    b) Find a conterminal angle that is in the negative direction of the given angle
    c) Find the reference angle α

1) $400°$ 2) $-280°$ 3) $940°$ 4) $1059°$ 5) $-624°$ 6) $-989°$

7) $327°$ 8) $148°$ 9) $563°$ 10) $-420°$ 11) $-197°$ 12) $1045°$

13) $\dfrac{6\pi}{3}$ 14) $\dfrac{9\pi}{2}$ 15) $\dfrac{11\pi}{3}$ 16) $\dfrac{-\pi}{3}$ 17) $\dfrac{36\pi}{13}$ 18) $\dfrac{8\pi}{3}$

19) $\dfrac{3\pi}{8}$ 20) $\dfrac{9\pi}{4}$