Classwork 13
Intermediate Algebra MTH 35
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Topic: Exponential and Logarithmic Equations

Name: ─────────────────────────────────────

Solve the following equations.

1. $2^{1-x} = 4$

2. $3^{2x-1} = 9$

3. $e^{2x} = 7$

4. $e^{2x+1} = 200$

5. $5^x = 4^{x+1}$

6. $\log(x - 4) = 2$

7. $\log_3(2 - x) = 3$

8. $2\log x = \log 2 + \log(3x - 4)$

9. $\log_2 x \log_2(x - 3) = 2$

10. $\log_5(x + 1) - \log_5(x - 1) = 2$

Name: ────────────────────────────

1. A certain bacteria population doubles every 4 hours. Initially there are 2000 bacteria in a colony.

   (a) Find a model for the bacteria population after t hours.

   (b) How many bacteria are in colony after 15 hours ?

   (c) When will the bacteria count reach a million ?

2. In a particularly bad zombie outbreak in Freaktown, the population of zombies was 100,000 in 2050, and 300,000 in 2055. Assuming that the zombie population grows exponentially,

   (a) Find a function that models the zombie population t years after 2050.

   (b) Find the time require for the population to double.

   (c) Predict the zombie population in 2075.

3. The half-life of strontium-90 is 28 years. How long will it take a 50-mg sample to decay to a mass of 32 mg.

4. After 3 days, a sample of radon-222 has decayed to 58% of its original amount.

   (a) What is the half-life of radon-222 ?
   (b) How long will it take the sample to decay to 20 % of its original amount ?

Name: _____

1. Convert from degree to radians.

   (a) $270° = $ _____

   (b) $120° = $ _____

   (c) $-120° = $ _____

   (d) $-135° = $ _____

   (e) $480° = $ _____

   (f) $540° = $ _____

2. Convert from radians to degrees.

   (a) $\pi/4 = $ _____

   (b) $3\pi/2 = $ _____

   (c) $-5\pi/6 = $ _____

   (d) $-4\pi/3 = $ _____

   (e) $8\pi/3 = $ _____

   (f) $-3\pi/2 = $ _____

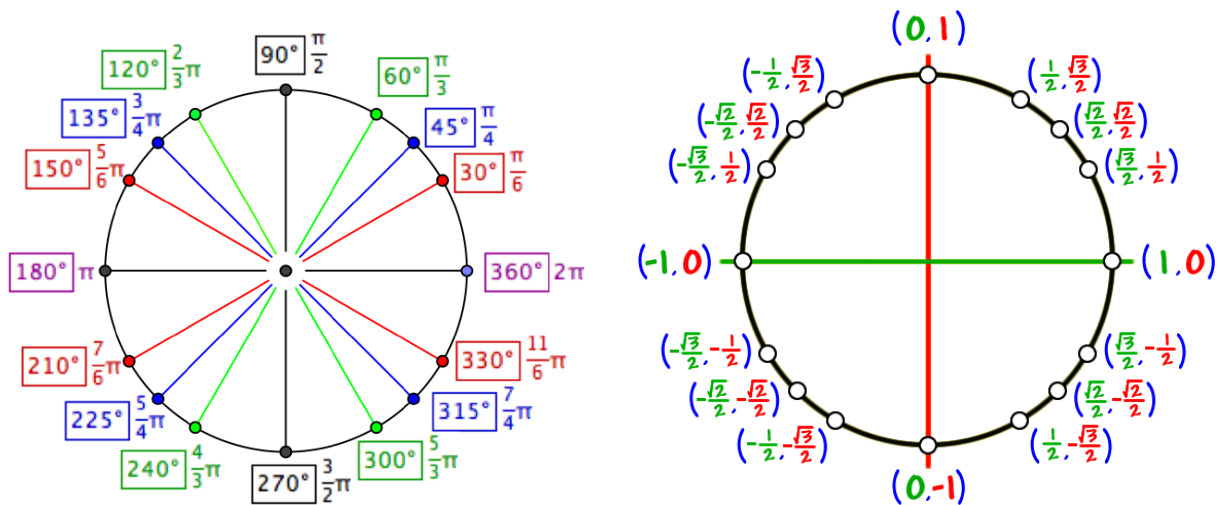3. Using the figures below, find the terminal point on the unit circle determined by the real numbers:

   (a) $t = -\pi/4$

(b) $t = 5\pi/6$

(c) $t = -5\pi/3$

(d) $t = 8\pi/3$

(e) $t = 5\pi/4$

Name: _____

1. Find the co-ordinates of the point $P(x, y)$ if

   (a) if P is in the second quadrant and the y-coordinate is $1/3$.

   (b) if P is in the third quadrant and the x-coordinate is $-3/4$.

2. If $\cos t = 1/3$ and t is in quadrant IV, find the values of all the trigonometric functions at t.

3. If $\sin t = 2/5$ and t is in quadrant I, find the values of all the trigonometric functions at t.

4. If $\sin t = -4/7$ and t is in quadrant III, find the values of all the trigonometric functions at t.