PRACTICE for Placement Quiz MA105

Similar questions will be used to test if you are ready to take Math M215 (Calculus I) The actual quiz MA103 will have 30 multiple choice questions.

****Questions covered in M125 (Pre-Calculus)****

1. Graph each of the following and find the x- and y-intercepts:
   a) \(3x - 2y + 4 = 0\)  
   b) \(y = -(x - 2)^2 + 1\)  
   c) \(y = x^2 - 4x + 2\)

2) Evaluate:
   a) \(27^{\frac{3}{4}} \cdot 16^{-\frac{1}{4}}\)  
   b) \(\log_6 2 + \log_6 3\)  
   c) \(\log_3 \frac{1}{81}\)

3) Solve each equation for \(x\):
   a) \(\frac{1}{x - 1} = 3 - \frac{5}{x - 1}\)  
   b) \(\frac{(3x - 1)(x + 4)}{x - 2} = 0\)  
   c) \(y = e^{-3(x+1)}\)  
   d) \(\log_5 (x + 1) = 2\)

4) Find the inverse function of \(f(x) = 4 - 3x\).

5) Find the center and radius of the circle with equation \(x^2 - 10x + y^2 + 6x = 2\).

6) Let \(g(x) = \sqrt{x}\) and \(h(x) = \frac{x}{x^2 - 1}\). Find each of the following:
   a) The domain of \(g(x)\)  
   b) The domain of \(h(x)\)  
   c) \((g \circ h)(x)\)  
   d) \((h \circ g)(x)\)

****Questions covered in M126 (Trigonometry)****

7) Evaluate:
   a) \(\sin \left( -\frac{2\pi}{3} \right)\)  
   b) \(\sec \left( \frac{3\pi}{4} \right)\)

8) Solve each equation for \(x\):
   a) \(\frac{4}{3} \pi \text{ radians} = x \text{ degrees}\)  
   b) \(150^\circ = x \text{ radians}\)

9) If \(\sin x = \frac{3}{5}\) and \(\cos x = \frac{4}{5}\), then \(\sin 2x = ?\)

10) If \(\sin \alpha = 0.6\) and \(\cos \beta = 0.3\), then find each the following:
    a) \(\sin^2 \beta\)  
    b) \(\cos (\beta - \alpha)\)
**ANSWERS:**

1a) The graph is a line with $x$-intercept $-4/3$ and $y$-intercept 2.

b) Parabola with vertex $(2,1)$, $x$-intercepts 1 and 3, and $y$-intercept $-3$.

c) Parabola with vertex $(2,-2)$, $x$-intercepts $2 \pm \sqrt{2}$, and $y$-intercept 2.

2a) $3/2$  
       b) $1$  
       c) $-4$

3a) $3$  
       b) $-4, 1/3$  
       c) $-(\ln y + 3)/3$  
       d) $24$

4) $f^{-1}(x) = (4-x)/3$

5) Center $(5,-3)$, radius 6

6a) All non-negative $x$  
       b) $x \neq \pm 1$
       c) $\sqrt{x^{2} - 1}$  
       d) $\frac{\sqrt{x}}{x-1}$

7a) $-\sqrt{3}/2$  
       b) $-\sqrt{2}$

8a) 240  
       b) $5\pi/6$

9) $24/25$

10a) 0.91  
       b) $-0.27$