

Test C

- 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) $27^{1/3} 16^{-1/4} =$
 - b) $\log_6 2 + \log_6 3 =$
 - c) $\log_3 \frac{1}{81} =$
 - d) $\sin\left(-\frac{2\pi}{3}\right) =$
 - e) $\sec\left(\frac{3\pi}{4}\right) =$
- 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) $\log_5(x+1) = 2$
 - e) $\frac{4}{3}\pi$ radians $= x$ degrees
 - f) $150^\circ = x$ radians
- 4) Find all real solutions between -6 and 6 :
 - a) $x(x^2 + x - 6)(x^2 + 1) = 0$
 - b) $2\sin \pi x = 2$
 - c) $\tan x = -1$
- 5) Find the inverse function of $f(x) = 4 - 3x$.
- 6) If $f(x) = x^2$, find and simplify $f(x+h) - f(x)$.
- 7) Find the center and radius of the circle with equation $x^2 - 10x + y^2 + 6y = 2$.
- 8) Let $g(x) = \sqrt{x}$ and $h(x) = \frac{x}{x^2 - 1}$. Find each of the following:
 - a) The domain of g
 - b) The domain of h
 - c) $g(h(x))$
 - d) $h(g(x))$
- 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) $\cos(\beta - \alpha)$
- 11) If a triangle has sides of length 3 and 8 and included angle of 60 degrees, then the side opposite the angle has what length?
- 12) If $0 \leq \theta \leq \pi$ and $\sec \theta = -\frac{13}{12}$, what is $\tan \theta$?

Answers for PREPARATION, Test C:

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 **d)** $-\sqrt{3}/2$ **e)** $-\sqrt{2}$

3a) 3 **b)** $-4, 1/3$ **c)** $-(\ln y + 3)/3$ **d)** 24 **e)** 240 **f)** $5\pi/6$

4a) $-3, 0, 2$ **b)** $-5.5, -3.5, -1.5, 0.5, 2.5, 4.5$ **c)** $-5\pi/4, -\pi/4, 3\pi/4, 7\pi/4$

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

6) $x^2 + 2hx + h^2 - x^2 = h(2x + h)$

7) Complete the squares to get $(x - 5)^2 + (y + 3)^2 = 2 + 25 + 9 = 36$.

Center = (5, -3), radius = 6.

8a) All non-negative x **b)** $x \neq \pm 1$ **c)** $\sqrt{\frac{x}{x^2 - 1}}$ **d)** $\frac{\sqrt{x}}{x - 1}$

9) $\sin 2x = 2 \sin x \cos x = 24/25$

10a) $\sin^2 \beta = 1 - \cos^2 \beta = 0.91$ **b)** $\cos(\beta - \alpha) = \cos^2 \beta - \sin^2 \alpha = -0.27$

11) 7 (use Law of Cosines)

12) $\tan^2 \theta = \sec^2 \theta - 1 = 25/144$, $\tan \theta = -5/12$