

# MA 180/PRECALCULUS PRETEST

**SHOW ALL WORK.**

**CIRCLE YOUR ANSWERS.**

**WRITE YOUR EXACT ANSWERS UNLESS OTHERWISE INSTRUCTED.**

1. Solve for  $x$ .

a.  $8x - (2x - 1) = 3x - 10$

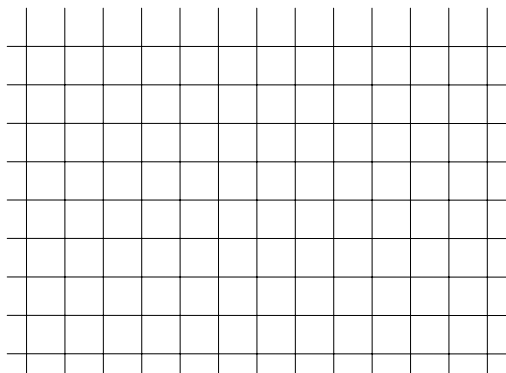
b.  $(x + 7)(x - 1) = (x + 1)^2$

c.  $1 - Ax - B = 0$

d.  $8 + 4(2 - x) \leq -2x$

2. Given  $2x - 3y = -6$

a. Graph the equation.



b. Determine the slope and y-intercept.

c. Select two points on the line to confirm, algebraically, that the slope you got from (b) is correct.

3. Simplify:

a.  $5(x^3)^2(-2x^4)^{-3}$

4. Factor completely:

a.  $3x^4 - 3$

b.  $x^4 + 4x^3 - 3x - 12$

5. Perform the indicated operation.

a.  $\frac{3}{x+6} - \frac{4}{x^2+12x+36}$

6. Solve the system of equations by any method:.

$$\begin{cases} 2x + 11y = 9 \\ 4x - 8y = 0 \end{cases}$$

7. Simplify.

a.  $\sqrt{5a^3b} \cdot \sqrt{3ab^5}$  (variables **a** and **b** are nonnegative)

b.  $(2\sqrt{3} + 4)(5\sqrt{3} - 6)$

8. Solve by factoring:  $6m^2 + 26m - 20 = 0$

9. Solve using the Quadratic Formula:  $2x^2 - x - 6 = 0$

10. Given  $f(x) = 3x^2 + \frac{6}{x} - 8$  and  $g(x) = -x^2 + 9$ :

a. Find  $g(0)$

b. Find  $g(-4)$

c. Find  $f(1+2)$

d.  $f(1) + 2$

e. Solve for  $x$ :  $g(x) = 0$ .

11. Given  $h(x) = 0.5x^3 - 4.5x + 2.8$ , use your graphing calculator to find the following in the standard window. Round your answers to the nearest thousandth.

a. relative minimum

b. relative maximum

c. each zero of  $h(x)$

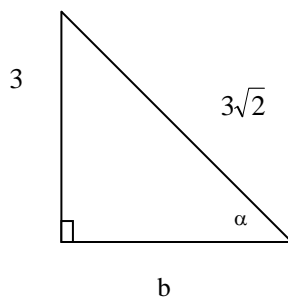
12. Use your calculator to find the following. Round your answers to 3 decimal places.

a.  $\sin 35^\circ$

b.  $\tan 81^\circ$

c.  $\cos 128^\circ$

13. Find  $b$  and  $\alpha$ .



14. Find two values of  $\theta$ ,  $0 \leq \theta < 2\pi$ , that satisfy the given trigonometric equation.

a.  $\sin \theta = \frac{\sqrt{3}}{2}$       b.  $\csc \theta = 2$       c.  $\tan \theta = -1$       d.  $\cos \theta = -\frac{\sqrt{3}}{2}$

15. A 12-foot ladder is resting against a wall and makes an angle of  $52^\circ$  with the ground. Find the height to which the ladder will reach the wall.

16. Convert the measure of each angle to exact radian measure.

a.  $15^\circ$       b.  $-225^\circ$       c.  $315^\circ$

17. Convert the radian measure of each angle to degree measure.

a.  $\frac{3\pi}{8}$       b. 1.5      c. 5.25

18. Find the six trigonometric functions for the angle  $\theta$  whose terminal side passes through the point  $(-8, -5)$

Answers to **MA 180/PRECALCULUS PRETEST**

1. a.  $-\frac{11}{3}$       b. 2      c.  $\frac{1-B}{A}$       d.  $x \geq 8$

2. b.  $m = \frac{2}{3}$        $b = 2$

3. a.  $-\frac{5}{8}x^{-6}$  or  $-\frac{5}{8x^6}$

4. a.  $3(x^2+1)(x+1)(x-1)$       b.  $(x^3-3)(x+4)$

5. a.  $\frac{3x+14}{x^2+12x+36}$

6.  $(\frac{6}{5}, \frac{3}{5})$

7. a.  $a^2b^3\sqrt{15}$       b.  $6+8\sqrt{3}$

8.  $m = \frac{2}{3}, -5$

9.  $x = -1.5, 2$

10. a. 9      b. -7      c. 21      d. 3      e.  $x = \pm 3$

11. a. -2.396      b. 7.996      c.  $x = -3.273, 0.653, 2.620$

12. a. 0.574      b. 6.314      c. -0.616

13.  $b = 3$        $\alpha = 45^\circ$

14. a.  $\frac{\pi}{3}, \frac{2\pi}{3}$       b.  $\frac{\pi}{6}, \frac{5\pi}{6}$       c.  $\frac{3\pi}{4}, \frac{7\pi}{4}$       d.  $\frac{5\pi}{6}, \frac{7\pi}{6}$

15. 9.5 feet

16. a.  $\frac{\pi}{12}$       b.  $-\frac{5\pi}{4}$       c.  $\frac{7\pi}{4}$

17.a.  $67.5^\circ$       b.  $85.94^\circ$       c.  $300.80^\circ$

18.  $\sin \theta = -\frac{5\sqrt{89}}{89}$        $\csc \theta = -\frac{\sqrt{89}}{5}$

$\cos \theta = -\frac{8\sqrt{89}}{89}$        $\sec \theta = -\frac{\sqrt{89}}{8}$

$\tan \theta = \frac{5}{8}$        $\cot \theta = \frac{8}{5}$