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. $1-Ax-B=0$

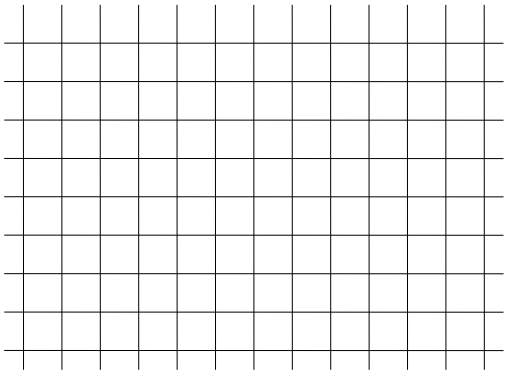
d. $8+4(2-x)\le -2x$

e. $\sqrt{x+6}=x$

f. $\dfrac{3}{x+2}=5$

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

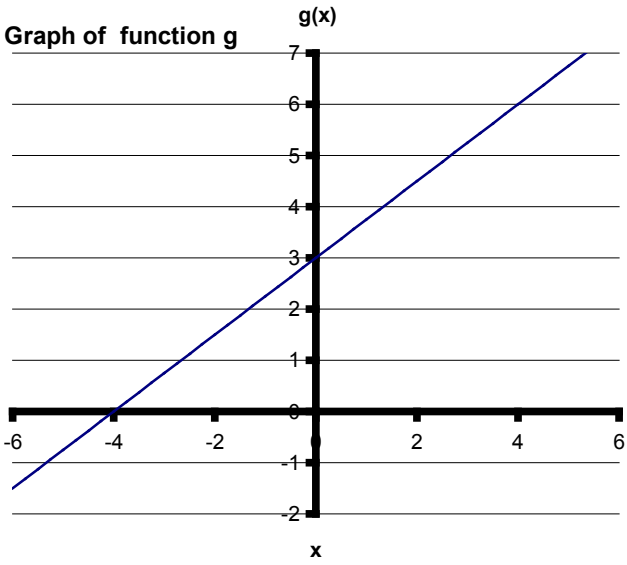
a. Graph the equation.



b. Determine the slope and y-intercept.

c. Select two points on the line and use them to confirm, algebraically, that the slope you calculated from part *(b)* is correct.

3. Answer these questions about the function g that is graphed at the right.



a. g(4) = _____

b. If $g(a) = 3$, then a = _____

c. The *zero* of function g is ____

4. Solve the system of equations by any algebraic method. $\begin{cases} 2x + 11y = 9 \\ 4x - 8y = 0 \end{cases}$

5. Each of parts to this question should be answered **without** the aid of a calculator.

x	$f(x)$
0	
1	
2	
3	

a. Complete the table on the right for $f(x) = 3^x$

b. For the same function *f,* determine the exact values of these:

$f(-1) =$ _____, $f(-2) =$ _____, $f(-3) =$ _____

6. **Without** the aid of a calculator determine the exact values of the following

a. $\left(\frac{9}{16}\right)^{-1}$ b. $\left(\frac{9}{16}\right)^{3/2}$ c. $(8)^{-3}$ d. $(8)^{1/3}$

e. $\log_3 81 =$ _____ f. $\log_3 1 =$ _____

7. Simplify without the aid of a calculator:

a. $5\sqrt{6}\left(\sqrt{24}\right)$ b. $\sqrt{-900}$ c. $\dfrac{-7\pm\sqrt{49+120}}{4}$

8. Simplify and write with positive exponents: $5\left(x^3\right)^2\left(-2x^4\right)^{-3}$

9. Solve:
Solve by Factoring:

a. $6m^2+26m=20$ b. $3x^3-27x=0$

c. Solve using the Quadratic Formula: $x^2+13=6x$

10. Given $g(x) = -x^2 + 9$:

a. Find *g(0)*

b. Find $g(-4)$

c. Find $f(0)$

d. $g(x)+5$

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

f. $g(x-5)$

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)*

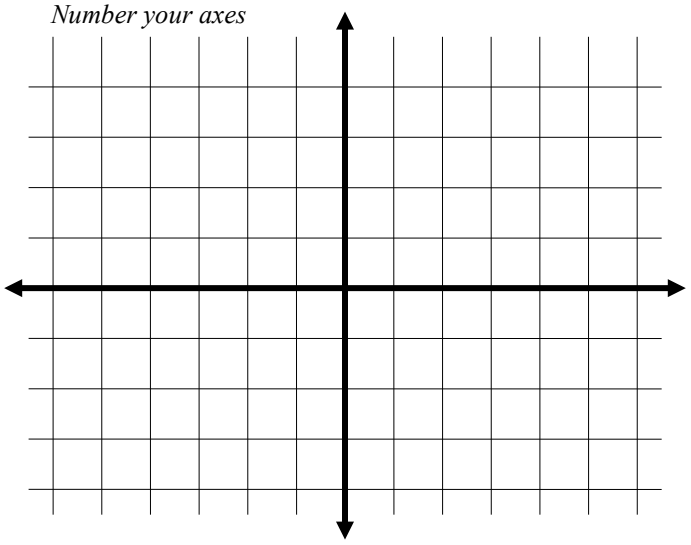
12. Given $f(x) = 3x^2 + \frac{6}{x} - 8$ and $h(x) = \sqrt{5-x}$

a. State the domain of the function *f.*

b. State the domain of the function *h.*

13. Graph the quadratic function $f(x) = x^2 - 8x + 7$ and find the vertex.

Number your axes

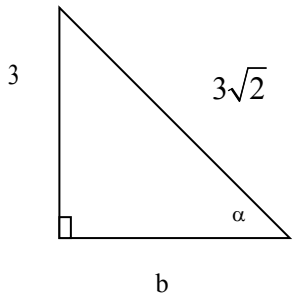


Trigonometry [administer mid-semester]:

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

a. $\sin 35°$ b. $\tan 81°$ c. $\cos 128°$ d. $\csc 75^\circ$

15. Find *b* and α.



16. Find two values of θ, $0 \le \theta < 2\pi$, that satisfy the given trigonometric equation.

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

17. A 12-foot ladder is resting against a wall and makes an angle of 52° with the ground. Find the height to which the ladder will reach the wall.

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

a. 15° b. -225° c. 315°

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

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

20. Find the six trigonometric functions for the angle θ 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. $x \geq 8$ e. 3 f. $-\frac{7}{5}$

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

3. a. 6 b. 0 c. –4

4. a. $\left(\frac{6}{5}, \frac{3}{5}\right)$

5. a.

1
3
9
27

b. $\frac{1}{3}$, $\frac{1}{9}$, $\frac{1}{27}$

6. a. – d. $\frac{16}{9}$, $\frac{27}{64}$, $\frac{1}{512}$, 2 e. 4 f. 0

7. a. 60 b. $30i$ c. –5, +3/2

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

9. a. $m = \frac{2}{3}, -5$ b. $x = 0, \pm 3$

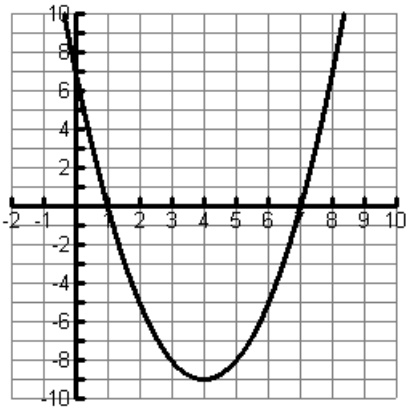
c. $x = 3 + 2i$ or $x = 3 - 2i$. These solutions are not real numbers.

10. a. 9 b. -7 c. undefined d. $-x^2 + 14$ e. $x = \pm 3$ f. $-x^2 + 10x - 16$

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

12. a. $x \neq 0$ b. $x \leq 5$

13. vertex: (4, -9)



14. a. 0.574 b. 6.314 c. -0.616 d. 1.035

15. $b = 3 \quad \alpha = 45^\circ$

16 .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. $\frac{5\pi}{6}, \frac{7\pi}{6}$

17. 9.5 feet

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

19.a. 67.5° b. 85.94° c. 300.80°

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

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

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