

Answer Key

I. Functions

1. a. Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$
- b. Domain: $(-\infty, \infty)$ Range: $[1, \infty)$
- c. Domain: $[4, \infty)$ Range: $[0, \infty)$

2. a. D: $(-\infty, 8)$ R: $[-3, \infty)$
- b. 2
- c. -8, -1.6, 2
- d. $(-5, 0) \cup (5, 8)$
- e. $(-\infty, -5) \cup (0, 5)$
- f. $\frac{8}{5}$ or 1.6
- g. Infinite number of possible answers: $(-7, -3)$, $(-8, 2)$, $(-6, -4)$, $(-2.5, 5)$
Intervals whose endpoints lie on $f(x)$ and on a horizontal line.
- h. $f(2x) = -3$; $2f(x) = 3$

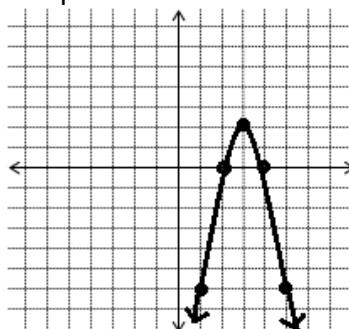
II. Solving Equations

1. ± 5 2. $\frac{3}{2}, -4$ 3. $\pm 2, \pm 2i$ 4. $\pm 3, \pm 2i$
5. $\pm 1, -5$ 6. $\frac{3}{2}, \pm 2\sqrt{2}i$

III. Quadratic Functions

1. Given $y = -2x^2 + 12x - 16$
 - a. Domain: $(-\infty, \infty)$
 - b. Range: $(-\infty, 2]$
 - c. x-intercept(s): $(4, 0), (2, 0)$
 - d. y-intercept(s): $(0, -16)$
 - e. vertex: $(3, 2)$
 - f. *Yes, this is a function. Every x goes to exactly one y . (This passes the vertical line test.)*

g. Graph:



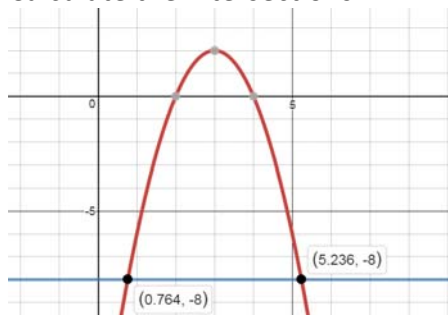
- h. Using a calculator, solve the following equation. Be sure to include a copy of your calculator graph and viewing window.
 $-2x^2 + 12x - 16 = -8$ Ans: 0.764 or 5.236

Solutions for h.

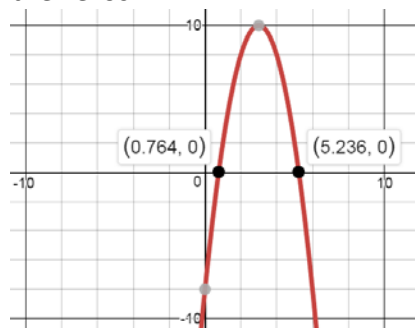
Let $y_1 = -2x^2 + 12x - 16$

Let $y_2 = -8$

Calculate the intersections.



Add 8 to both sides, then let $y_1 = -2x^2 + 12x - 8$.
 Calculate the zeros.



IV. Simplifying Compound Fractions

1. $\frac{1}{2}$

2. $\frac{-3y+3}{y}$

V. Properties of Exponents and Radicals

1. 84

2. $\frac{16x^8z^4}{y^{12}}$

3. $\frac{r^4}{y^4}$

4. xy^4

5. $\frac{a^4b^6}{c^7}$

6. 5

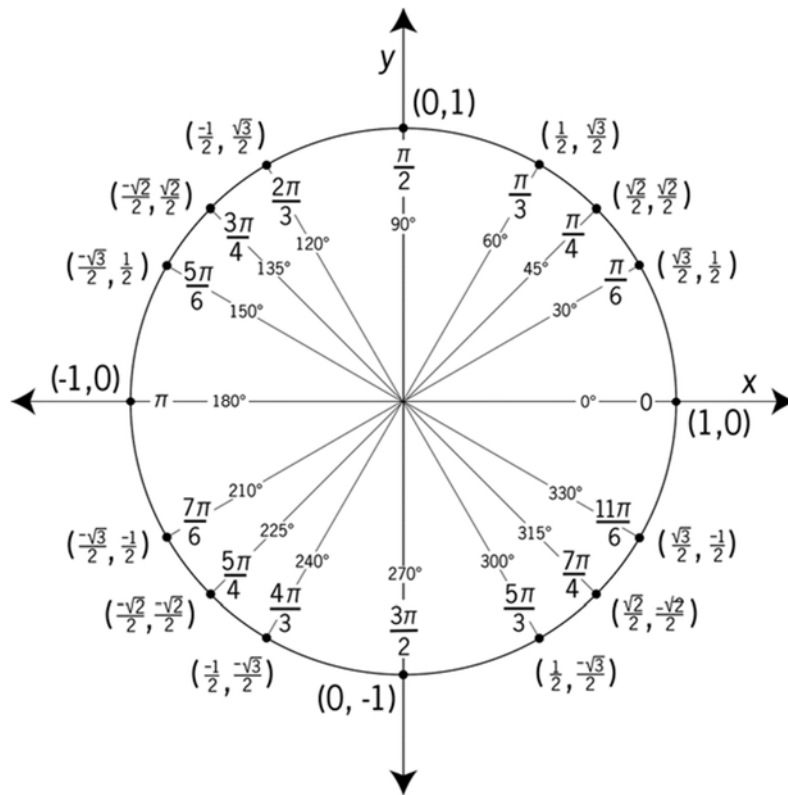
7. $2x^2y^4\sqrt{3}$

8. $\frac{\sqrt{3}}{2}$

9. $\frac{\sqrt{3}}{3}$

10. 45

VI. Trigonometry and the Unit Circle



Find the values. *No Calculator*

1. $\sin 45^\circ = \frac{\sqrt{2}}{2}$

2. $\cos 240^\circ = \frac{-1}{2}$

3. $\sin 330^\circ = \frac{-1}{2}$

4. $\sin \frac{2\pi}{3} = \frac{\sqrt{3}}{2}$

5. $\cos \frac{7\pi}{6} = \frac{-\sqrt{3}}{2}$

6. $\sin \frac{3\pi}{2} = -1$

7. $\cos \frac{3\pi}{4} = \frac{-\sqrt{2}}{2}$

8. $\sin \frac{-11\pi}{6} = \frac{1}{2}$

9. $\cos 0 = 1$

10. $\sin 3\pi = 0$