# Glendale Community College, AZ

# College Algebra Review
# for
# ASSET Placement Exam

This exam is intended as an overall review and includes problems similar to what you may expect on the ASSET exam. However, it is NOT a sample exam.

## ASSET Exam Info

1. You have 25 minutes to complete the multiple choice exam.
2. The Numerical Skills exam has 32 questions. All other exams have 25 questions.
3. No calculator allowed on the Numerical Skills exam. On all other exams you may use a scientific calculator. No programmable or graphing calculators are allowed. Most problems on the exam do not require a calculator and can be solved quickly with paper and pencil.
4. Be sure you start of with the right exam! If you don't know what exam to take, start off with the Elementary Algebra Exam.
5. The most important factor in successfully completing the exam is *time*. Don't spend too much time on one question. If you get stuck, move on, and then come back to it.

---

This review was created by the GCC ASSET Exam Committee: Walter A. Kehowski (Chair), Jason Bright, Anne Dudley, Miriam Pack. Please send any comments to

walter.kehowski@gcmail.maricopa.edu

---

**Glendale Community College, AZ**
**College Algebra Review**
**for**
**ASSET Placement Exam**

**1.** Simplify $\left(\frac{3a^2bc^4}{4ab^2}\right)^3$

**(a)** $\frac{3a^6c^{12}}{4b^2}$ **(b)** $\frac{3a^3c^{12}}{4b^3}$ **(c)** $\frac{27a^6c^{12}}{64b^3}$ **(d)** $\frac{27a^3c^{12}}{64b^3}$

---

**2.** Simplify $(64x^9y^3)^{1/3}$

**(a)** $\frac{64x^3y}{3}$ **(b)** $192x^{27}y^9$ **(c)** $4x^3y$ **(d)** $\frac{4}{x^3y}$

---

**3.** Simplify $\frac{x^2-1}{x+2} \cdot \frac{x^2+5x+6}{x^2+4x+3}$

**(a)** $x-1$ **(b)** $\frac{(x-1)(x+3)}{(x+2)(x-3)}$ **(c)** $x+1$ **(d)** $\frac{(x-1)(x+1)(x+6)}{(x+2)(x-3)}$

---

**4.** A jogger started a course and jogged at an average speed of 4 mph. One hour later, a cyclist started the same course and cycled at an average speed of 11 mph. How long after the jogger started did the cyclist overtake the jogger?

**(a)** $1\frac{5}{7}$ hours **(b)** $\frac{5}{7}$ hour **(c)** $1\frac{4}{7}$ hours **(d)** $\frac{4}{7}$ hour

---

**5.** A chemist mixes an 8% hydrochloric acid solution with a 5% hydrochloric acid solution. How many milliliters of the 5% solution should the chemist use to make a 750-milliliter solution that is 7% hydrochloric acid?

**(a)** 400 ml **(b)** 250 ml **(c)** 500 ml **(d)** 300 ml

---

**6.** Solve by factoring: $6z^2 - 7z - 3 = 0$.

**(a)** $-\frac{2}{3}, -\frac{1}{3}$ **(b)** $\frac{3}{2}, -\frac{1}{3}$ **(c)** $\frac{3}{2}, \frac{1}{3}$ **(d)** $-\frac{2}{3}, \frac{6}{7}$

---

**7.** Use the quadratic formula to solve $y^2 + 10y + 20 = 0$

**(a)** $\frac{-10 \pm \sqrt{10}}{2}$ **(b)** $4, 5$ **(c)** $-5 \pm \sqrt{5}$ **(d)** $-4, -5$

---

**8.** Solve by factoring: $x^3 = 81x$.

**(a)** $-9, 0, 9$ **(b)** $-3, 0, 3$ **(c)** $-9, 9$ **(d)** $0, 81$

---

**9.** Solve the inequality $-2x - 3 < 6$. Write the solution using set notation.

**(a)** $\{x|x < -3/2\}$ **(b)** $\{x|x > -9/2\}$ **(c)** $\{x|x < -9/2\}$ **(d)** $\{x|x > -3/2\}$

**10.** Given that $p$ varies inversely as the square root of $q$ and that $p = 3$ when $q = 9$, find $p$ when $q = 16$.

**(a)** $\frac{9}{4}$ **(b)** $\frac{3}{4}$ **(c)** $\frac{4}{3}$ **(d)** $9/2$

---

**11.** Given that $n$ varies directly with the square of $p$ and inversely as the square of $q$, and that $n = 12$ when $p = 3$, $q = 2$, find $n$ when $p = 6$, $q = 4$.

**(a)** $12$ **(b)** $4/3$ **(c)** $9/16$ **(d)** $16/9$

---

**12.** Determine the $x$ and $y$ intercepts of the graph of $5x + 2y = 10$.

**(a)** $(5,0),(0,2)$ **(b)** $(2,0),(0,5)$ **(c)** $(5,0),(2,0)$ **(d)** $(0,5),(0,2)$

---

**13.** Given $f(x) = 2x - 4$, find $f(-4)$.

**(a)** $4$ **(b)** $-4$ **(c)** $32$ **(d)** $-12$

---

**14.** Given $g(x) = x^2 - 1$, find $g(h + 2)$.

**(a)** $h^2 + 4h + 5$ **(b)** $h^2 + 4h + 3$ **(c)** $h^2 + 1$ **(d)** $h^2 + 2h + 3$

---

**15.** Determine the domain of the function $f(x) = \frac{3}{\sqrt{x-2}}$.

**(a)** $(-\infty, 2) \cup (2, \infty)$ **(b)** $[2, \infty)$ **(c)** $(-\infty, 2] \cup [2, \infty)$ **(d)** $(2, \infty)$

---

**16.** A van was purchased for \$29,000. Assuming that the van depreciates at a constant rate of \$4000 per year (straight-line depreciation) for the first 7 years, write the value $v$ of the van as a function of time $t$, $0 \le t \le 7$, and calculate the value of the van 3 years after purchase.

**(a)** $v(t) = 29,000 - 4000t,\ v(3) = 17,000$ **(b)** $v(t) = 4000t,\ v(3) = 12,000$

**(c)** $v(t) = 29,000 + 4000t,\ v(3) = 41,000$ **(d)** $v(t) = \frac{4000}{3t},\ v(3) = 444.44$

---

**17.** Find the equation of the line with slope $3/5$ and $y$-intercept $(0, -5)$.

**(a)** $y = \frac{3}{5}x - 3$ **(b)** $y = \frac{5}{3}x - 5$ **(c)** $y = \frac{3}{5}x - 5$ **(d)** $y = \frac{5}{3}x + 5$

---

**18.** Find the equation in slope-intercept form of a line that passes through $(-3, 5)$ and $(6, 8)$.

**(a)** $y = \frac{1}{3}x + 6$ **(b)** $y = 3x + 10$ **(c)** $y = 3x + 14$ **(d)** $y = \frac{1}{3}x - \frac{14}{3}$

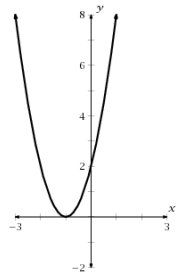
---

**19.** Find the value of $x$ in the domain of $f(x) = 4x + 1$ for which $f(x) = -1$.

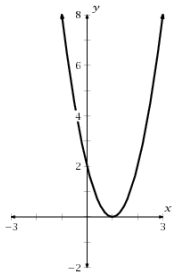
**(a)** $-3$ **(b)** $0$ **(c)** $-1/4$ **(d)** $-1/2$

**20.** Graph $f(x) = 2(x+1)^2$.

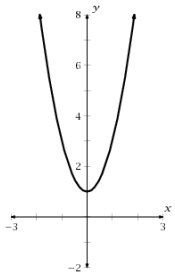
**(a)**



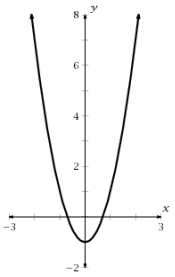
**(b)**



**(c)**



**(d)**



---

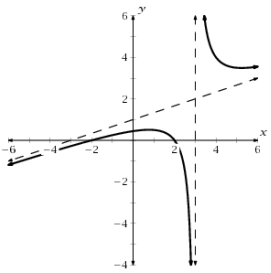
**21.** Solve the equation $x^3 - 5x^2 - 4x + 20 = 0$.

**(a)** $-2, 2, 5$ **(b)** $-5, 2i, -2i$ **(c)** $-5, -2, 2$ **(d)** $5, 2i, -2i$

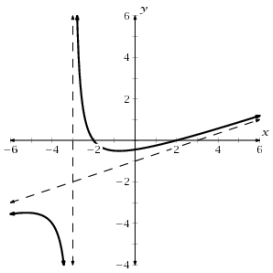
---

**22.** Graph $f(x) = \dfrac{x^2 - 4}{3x + 9}$

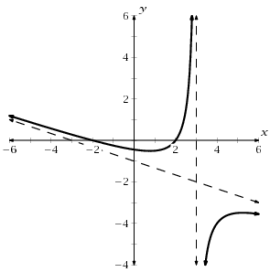
**(a)**



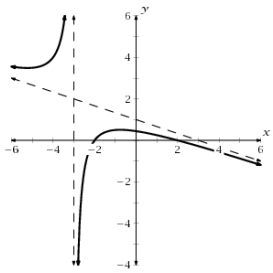
**(b)**



**(c)**



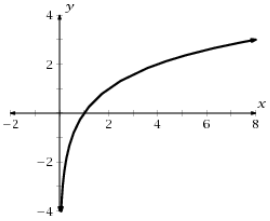
**(d)**



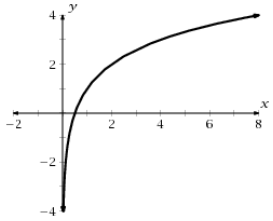
---

**23.** Graph $f(x) = -1 + \log_2 x$.

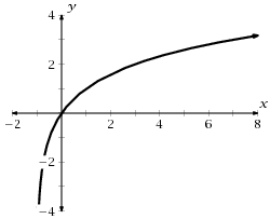
**(a)**



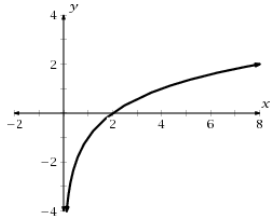
**(b)**



**(c)**



**(d)**



---

**24.** Write $\log_b \dfrac{y^2}{xz^5}$ in terms of $\log_b x$, $\log_b y$, and $\log_b z$.

**(a)** $2\log_b y - 5\log_b xz$

**(b)** $2\log_b y - \log_b x + 5\log_b z$

**(c)** $2\log_b y - \log_b x - 5\log_b z$

**(d)** $2\log_b y + \log_b x + 5\log_b z$

---

**25.** Write $\log_{10}(x+3) - 4\log_{10} x$ as a single logarithm.

**(a)** $\log_{10}[(x+3) + x^4]$

**(b)** $\log_{10}(x+3)x^4$

**(c)** $\log_{10} \dfrac{x+3}{x^4}$

**(d)** $\log_{10} \dfrac{x+3}{4x}$

**26.** Solve $5^x = 94$.

**(a)** $\dfrac{\log 94}{\log 5}$ **(b)** $\dfrac{\log 5}{\log 94}$ **(c)** $\dfrac{94}{5}$ **(d)** $\sqrt[5]{94}$

---

**27.** Solve $\log x + \log(x - 15) = 2$.

**(a)** 5 **(b)** $-5, 20$ **(c)** 20 **(d)** No solution.

---

**28.** Solve $\log 10^{4x-3} = 7$.

**(a)** 2.5 **(b)** 1 **(c)** $-0.4542$ **(d)** No solution.

---

**29.** If $\theta$ is an acute angle of a right triangle and $\cot\theta = 12/5$, find $\csc\theta$.

**(a)** $12/13$ **(b)** $5/13$ **(c)** $13/12$ **(d)** $13/5$

---

**30.** Find the exact value of $\sin 30° - \sin 45° \cos 45°$.

**(a)** 0 **(b)** $1/2$ **(c)** 1 **(d)** 2

---

**31.** Evaluate $\sin\dfrac{20\pi}{6}$.

**(a)** $\dfrac{\sqrt{3}}{2}$ **(b)** $-\dfrac{\sqrt{3}}{2}$ **(c)** $\dfrac{1}{2}$ **(d)** $-\dfrac{1}{2}$

---

**32.** Find the values of all six trigonometric functions with the angle in standard position with the terminal side passing through the point $P(24, -7)$.

**(a)** $\sin\theta = -7/25$, $\cos\theta = 24/25$, $\tan\theta = -7/24$, $\csc\theta = -25/7$, $\sec\theta = 25/24$, $\cot\theta = -24/7$

**(b)** $\sin\theta = 7/25$, $\cos\theta = -24/25$, $\tan\theta = -7/24$, $\csc\theta = 25/7$, $\sec\theta = -25/24$, $\cot\theta = -24/7$

**(c)** $\sin\theta = 24/25$, $\cos\theta = -7/25$, $\tan\theta = -24/7$, $\csc\theta = 25/24$, $\sec\theta = -25/7$, $\cot\theta = -7/24$

**(d)** $\sin\theta = -7/25$, $\cos\theta = 24/25$, $\tan\theta = -24/7$, $\csc\theta = -25/7$, $\sec\theta = 25/24$, $\cot\theta = -7/24$

---

**33.** Find the exact value of $\cos^2 180° - \sin^2 120°$.

**(a)** $-1/4$ **(b)** $7/4$ **(c)** $1/4$ **(d)** $3/4$

---

**34.** Write $\cos 8\alpha \cos 3\alpha + \sin 8\alpha \sin 3\alpha$ in terms of a single trigonometric function.

**(a)** $\sin 5\alpha$ **(b)** $\cos 11\alpha$ **(c)** $\cos 5\alpha$ **(d)** $\sin 11\alpha$

---

**35.** Find an exact radian value for $\sin^{-1}\left(\dfrac{1}{2}\right)$.

**(a)** $\dfrac{\pi}{6}$ **(b)** $-\dfrac{\pi}{6}$ **(c)** $\dfrac{\pi}{3}$ **(d)** $-\dfrac{\pi}{3}$

**36.** Solve the equation $2\cos^2 x + \sin x + 1 = 0,\ 0 \le x \le 2\pi$.

**(a)** $\pi$ **(b)** $\frac{3\pi}{2}$ **(c)** $\frac{\pi}{3}, \pi, \frac{5\pi}{3}$ **(d)** $\frac{\pi}{3}, \frac{5\pi}{3}$

---

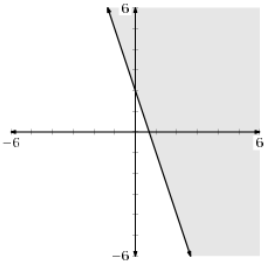
**37.** Solve the system of equations $\begin{cases} 2x - 3y = -5 \\ -3x + y = 4 \end{cases}$.

**(a)** $(1, -1)$ **(b)** Dependent **(c)** Inconsistent **(d)** $(-1, 1)$

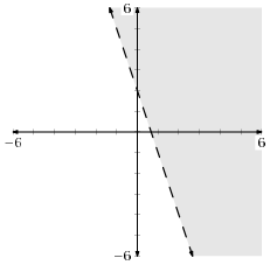
---

**38.** Graph the inequality $3x + y \ge 2$.

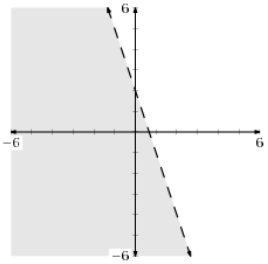
**(a)**



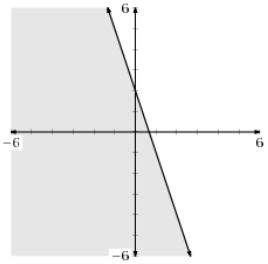

**(b)**




**(c)**




**(d)**




---

# College Algebra Review
## for
# ASSET Placement Exam

## ANSWER KEY

| | | | |
|---|---|---|---|
| 1. d | 11. a | 21. a | 31. b |
| 2. c | 12. b | 22. b | 32. a |
| 3. a | 13. d | 23. d | 33. c |
| 4. c | 14. b | 24. c | 34. c |
| 5. b | 15. d | 25. c | 35. a |
| 6. b | 16. a | 26. a | 36. b |
| 7. c | 17. c | 27. c | 37. d |
| 8. a | 18. a | 28. a | 38. a |
| 9. b | 19. d | 29. d | |
| 10. a | 20. a | 30. a | |