# Glendale Community College, AZ

## College Algebra Review
### for
### Accuplacer Placement Exam

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

### Accuplacer Exam Info

- Consult the following web site for the most up-to-date information on placement testing at GCC.

  `http://www.gccaz.edu/testing`

  Google "GCC Testing Services."

- The most recent version of this exam should be available at

  `http://www2.gccaz.edu/academics/departments/mathematics-computer-science/assessment-practice-tests.`

- Please send any comments to

  `walter.kehowski@gccaz.edu`

  Please include the following information in your email:

  LAST COMPILED DATE: August 18, 2017

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

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

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

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

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

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

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

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**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

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

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

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

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

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

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

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**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) $\dfrac{9}{4}$

(b) $\dfrac{3}{4}$

(c) $\dfrac{4}{3}$

(d) $9/2$

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**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) $16/9$

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**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) $(0, 5), (0, 2)$

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

(a) $4$

(b) $-4$

(c) $32$

(d) $-12$

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**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) $h^2 + 2h + 3$

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

(a) $(-\infty, 2) \cup (2, \infty)$

(b) $[2, \infty)$

(c) $(-\infty, 2] \cup [2, \infty)$

(d) $(2, \infty)$

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**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) $v(t) = \dfrac{4000}{3t}$, $v(3) = 444.44$

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

(a) $y = \dfrac{3}{5}x - 3$

(b) $y = \dfrac{5}{3}x - 5$

(c) $y = \dfrac{3}{5}x - 5$

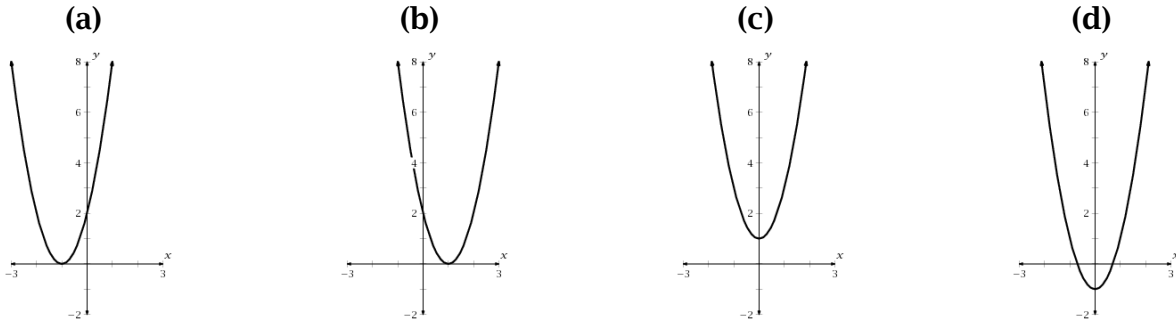(d) $y = \dfrac{5}{3}x + 5$

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

(a) $y = \dfrac{1}{3}x + 6$

(b) $y = 3x + 10$

(c) $y = 3x + 14$

(d) $y = \dfrac{1}{3}x - \dfrac{14}{3}$

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**19.** Find the value of $x$ in the domain of $f(x) = 4x + 1$ for which $f(x) = -1$.
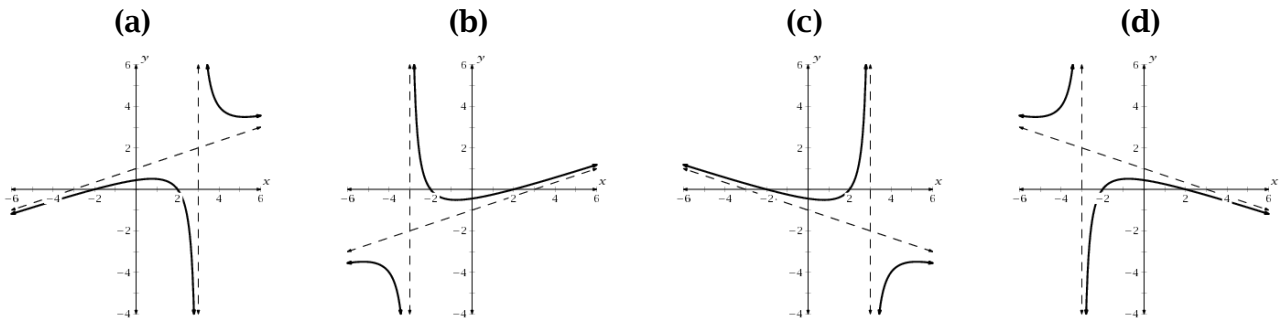
(a) $-3$

(b) $0$

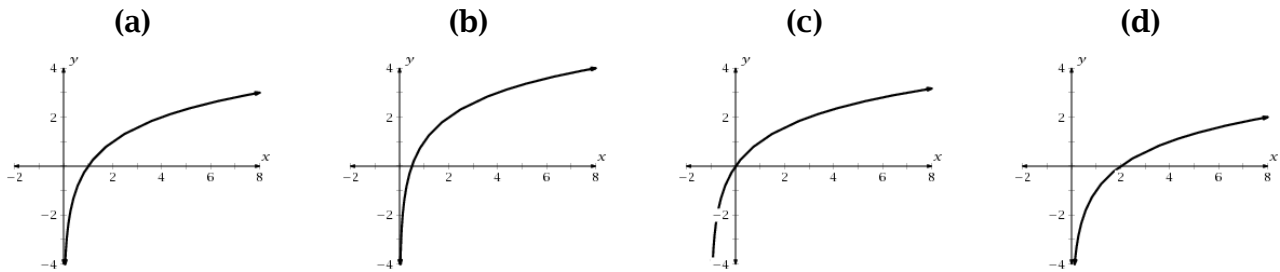(c) $-1/4$

(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) $\sqrt[5]{94}$

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

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

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

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

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**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) $13/5$

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

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

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

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

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

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

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

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**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) $\sin 11\alpha$

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**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 $\quad 2\cos^2 x + \sin x + 1 = 0, \ 0 \leq x \leq 2\pi$.

(a) $\pi$

(b) $\dfrac{3\pi}{2}$

(c) $\dfrac{\pi}{3}, \pi, \dfrac{5\pi}{3}$

(d) $\dfrac{\pi}{3}, \dfrac{5\pi}{3}$

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**37.** Solve the system of equations $\begin{cases} 2x - 3y = -5 \\ -3x + y = 4 \end{cases}$.
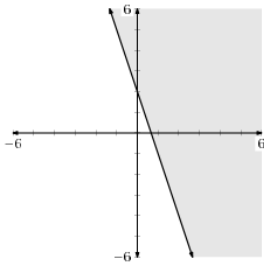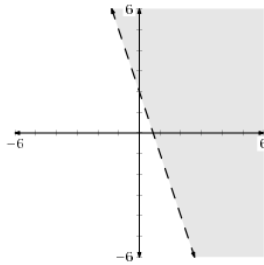
(a) $(1, -1)$

(b) Dependent

(c) Inconsistent
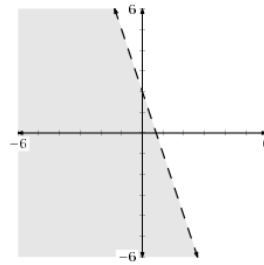
(d) $(-1, 1)$

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

(a)

(b)

(c)

(d)



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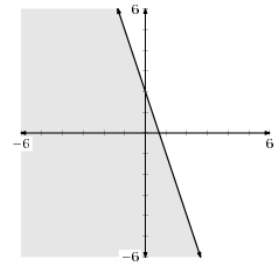
# College Algebra Review
### for
## Accuplacer Placement Exam

## 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 | |