Accuplacer Advanced Algebra Test Review Material

Math Physics Resource Center

1 *Perform the following operations and simplify:*

(a) $\frac{1}{x+4} + \frac{1}{x+5}$

(b) $\frac{6}{5y} + \frac{y}{25}$

(c) $\frac{4x}{6x^2+3x} \div \frac{7}{2x+1}$

2 *Multiply the following:*

(a) $(x+5)(x+7)$

(b) $5x(4x+6)$

(c) $(3x+1)(7x-5)$

(d) $(2x+5)^2$

3 *Factor the following*

(a) $x^2 - 7x + 10$

(b) $3x^2 - 5x - 2$

(c) $10x^2 + 24x + 14$

(d) $x^2 - 9$

(e) $x^4 - 16$

(f) $x^3 - 125$

(g) $4x^3 + 2x^2 + 6x + 3$

4 *Simplify all of the following as much as possible. Use absolute value when appropriate:*

(a) $\sqrt{288x^7y^2}$

(b) $\sqrt[3]{54x^5y^6}$

(c) $\sqrt{28z^2y^3}$

(d) $\sqrt[3]{48z^3 + 8z^9}$

(e) $\sqrt[3]{24z^4y^5}$

5 *Simplify the following as much as possible. Rewrite without any negative exponents.*

(a) $\left(\frac{3a^2b^4}{c^2}\right)^3\left(\frac{b^2c^3}{2a^4}\right)$

(b) $\frac{(6a^2c^0b^7)^2}{(2b^5c^2)}$

(c) $\frac{(4c^2b^5)}{(2a^2c^{-2})^{-3}}$

6 *Solve the following systems of equations, or state if it has infinitely many or no solutions:*

(a) $\begin{cases} 3x + 4y = 5 \\ -6x + 7y = 5 \end{cases}$

(b) $\begin{cases} x + 2y = 13 \\ 3x + 6y = 4 \end{cases}$

(c) $\begin{cases} 4x + y - 3z = 11 \\ 2x - 3y + 2z = 0 \\ x + y + z = -3 \end{cases}$

7 *Solve the following equations, or state if there is no solution.*

(a) $|x - 5| = 6$

(b) $|x + 2| = -2$

(c) $|x - 3| + 5 = 15$

(d) $|x + 4| + 4 = 0$

8 *Solve the following quadratic equations, write complex solutions in $a + bi$ form.*

(a) $(x + 5)(x + 3) = (x + 5)$

(b) $(x + 6)^2 + 5 = 0$

(c) $(x-17)^2 = 12$

(d) $3x^2 - 16x = -5$

(e) $14x^2 + 13x + 3 = 0$

(f) $x^2 - 9 = 0$

9 *Solve the following equations. Check for extraneous solutions:*

(a) $\frac{1}{x} + \frac{1}{6} = \frac{1}{5}$

(b) $\frac{1}{x+2} + \frac{3}{x} = \frac{1}{6}$

(c) $\frac{x}{3x+7} + \frac{5}{x+5} = \frac{-40}{3x^2+22x+35}$

10 *Solve the following inequalities. Graph the solution, and give your answer in interval notation.*

(a) $\frac{1}{x+2} \geq \frac{1}{x-3}$

(b) $x^2 - 5x - 6 < 0$

(c) $x + 7 - \frac{63}{x+5} \leq 0$

(d) $x^3 - 4x^2 + 4x - 16 > 0$

(e) $x^3 - 36x > 0$

11 *State what shape each of the following describes:*

(a) $\{(x, y) | x^2 + y^2 = 1\}$

(b) $\{(x, y) | x = 3y^2 + 1\}$

(c) $\{(x, y) | 3x + 2y = 5\}$

12 *Compute the distance between the following points:*

(a) $(1, 2)$ *and* $(-5, 5)$

(b) The nonzero endpoints of the line segments of length 3 and 4 lying along the coordinate axes, and beginning at the origin.

13 *Compute the determinant of the following matrices:*

(a) $\begin{pmatrix} 4 & 5 \\ 6 & 7 \end{pmatrix}$

(b) $\begin{pmatrix} 1 & 2 & 4 \\ 3 & 0 & 5 \\ 7 & 2 & 3 \end{pmatrix}$

14 *Compute the inverse of the following functions:*

(a) $f(x) = 5x + 3$

(b) $g(x) = \frac{4+x}{3}$

(c) $h(x) = x^2 + 3 \ , \ x \leq 0$

15 *Use properties of logarithms to expand or condense the following expressions:*

(a) $\log\left(\frac{2x^5}{y^4}\right)$

(b) $3\log(x) + 5\log(y) - 6\log(2x)$

(c) $4\log(2x) + \frac{1}{2}\log(y)$

(d) $\log\left(\frac{2x-y}{49z^2}\right)$

16 *Solve the following equations:*

(a) $5^{2x} = 125^3$

(b) $\log_3(9x) = 3$

(c) $e^{2x} = 16$

17 *Solve the following trigonometric equations, give solutions on* $[0, 2\pi)$*:*

(a) $\sin^2(x) - \frac{3}{4} = 0$

(b) $2\cos^2(x) + 3\cos(x) + 1 = 0$

(c) $2\tan(t) - \sec^2(t) = 0$

(d) $2\sin^2(t) - 9\sin(t) = 5$

(e) $\tan^2(x)\sin(x) = \sin(x)$