Document sample:

Algebra I: Sub-skills
SECTION I - Overview

● **This section accounts for 58½ of the items on the 65-item Algebra CST Assessment.**

● **There are approximately 17 pages of conceptual content that underlies the manner in which the standard is assessed on the state's Algebra CST.**

● **There are 16 pages that list the Released CST Items, through 2007.**

● Standards included in Section I are listed below:

2.0   Understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. Understand and use the rules of exponents.   (4 items on CST)

4.0   Simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x – 5) + 4(x – 2) = 12$. (3 items on CST)

5.0   Solve multi-step problems, including word problems, involving linear equations, and linear inequalities in one variable and provide justification for each step. (6 items on CST)

25.3 Determine whether a statement is true sometimes, always, or never when given a specific algebraic statement involving linear, quadratic, or absolute value expressions, equations, or inequalities. (½ item on CST)

6.0   Graph linear equation. Compute the x- and y-intercepts. (Graph $2x + 6y = 4$). Sketch the region defined by a linear inequality. (Sketch region defined by $2x + 6y < 4$).   (4 items on CST)

7.0   Verify that a point lies on a line when given an equation of the line. Derive linear equations by using the point-slope formula. (4 items on CST)

9.0   Solve a system of two linear equations in two variables algebraically. Interpret the answer graphically. Solve a system of two linear inequalities in two variables. Sketch the solution set. (5 items on CST)

10.0 Add, subtract, multiply, and divide monomials and polynomials. Solve multi-step problems, including word problems, using these techniques. (4 items on CST)

Algebra - California Content Standards, CST Items, Skills' Base

<u>Major Concepts</u>
2.0 Understand and use such operations as taking opposite, finding the reciprocal, taking a root, and raising to a fractional power. Understand and use rules of exponents.   (4 items on CST)

> **opposites:** these are two whole numbers that are equidistant from zero on the number line   5 and ⁻5 are opposites

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> **reciprocal:** a reciprocal is formed by writing 1 over a positive or negative whole number
> The reciprocal of 9 is $\frac{1}{9}$.   Note that 0 does not have a reciprocal.
>
> ---
>
> > ***multiplicative inverse:*** a number times its reciprocal is equal to 1
> >
> > $$9 \times \frac{1}{9} = 1$$

> **square root:** ($\sqrt{}$) 5 x 5 = 25 and the square root of 25 is 5
> (also, see exponent rules, raise to fractional power)

> **exponents:** the power to which a base number or algebraic variable is raised
> 5^4 means 5 x 5 x 5 x 5 and m^2 means m x m
>
> ---
>
> > ***zero property:*** for any number or variable (nonzero) the zero exponent results in the "answer" 1
> > $5^0 = 1$ and $m^0 = 1$
> >
> > ---
> >
> > ***negative exponents:***   for any number or variable (nonzero) a negative exponents results in a reciprocal
> > $$m^{-3} = \frac{1}{m^3}$$
> >
> > ---
> >
> > ***exponent rules:***
> > > ***multiplication:*** $x^2 \bullet x^4 = x^{(2+4)}$ or x^6
> > >
> > > ***division:*** $x^4 \div x^2 = x^{(4-2)} = x^2$
> > >
> > > ***exponent times exponent:*** $(x^2)^4 = x^{(4 \times 2)} = x^8$ and $(x^r)^m = x^{rm}$
> > >
> > > ***raise to fractional power:*** $x^{1/2}$ is the square root of x, so
> > > $25^{\frac{1}{2}}$ is equal to 5

Released Items through 2007:

2. $\sqrt{16} + \sqrt[3]{8}$ = (Correct B)
     A. 4   B. 6   C. 9   D. 10