

## ALGEBRA

### Expanding

- {1}  $a(b+c) = ab+ac$
- {2}  $(a+b)^2 = a^2+2ab+b^2$
- {3}  $(a-b)^2 = a^2-2ab+b^2$
- {4}  $(a+b)(a+c) = a^2+ac+ab+bc$
- {5}  $(a+b)(c+d) = ac+ad+bc+bd$
- {6}  $(a+b)^3 = a^3+3a^2b+3ab^2+b^3$
- {7}  $(a-b)^3 = a^3-3a^2b+3ab^2-b^3$
- {8}  $a^2-b^2 = (a+b)(a-b)$
- {9}  $a^3+b^3 = (a+b)(a^2-ab+b^2)$
- {10}  $a^3b-ab^3 = ab(a^2+b^2)(a-b)$
- {11}  $a^2-2ab+b^2 = (a-b)^2$
- {12}  $a^3-b^3 = (a-b)(a^2+ab+b^2)$

### Laws of Exponents

- {1}  $a^r a^s = a^{r+s}$
- {2}  $a^r / a^s = a^{r-s}$
- {3}  $a^r a^s / a^p = a^{r+s-p}$
- {4}  $(a^r)^s = a^{rs}$
- {5}  $(ab)^r = a^r b^r$
- {6}  $(a/b)^r = a^r / b^r$  ( $b \neq 0$ )
- {7}  $a^0 = 1$  ( $a \neq 0$ )
- {8}  $a^{-r} = 1/a^r$  ( $a \neq 0$ )

*if r and s are positive integers*

### Logarithms

- {1}  $\text{Log}(xy) = \text{Log } x + \text{Log } y$
- {2}  $\text{Log } x^r = r \text{Log } x$
- {3}  $\text{Log } x = n \iff x = 10^n$  (Common log)
- {4}  $\text{Log}_a x = n \iff x = a^n$  (Log to the base a)
- {5}  $\text{Ln } x = n \iff x = e^n$  (Natural log)
- {6}  $\text{Log}(x/y) = \text{Log } x - \text{Log } y$

$e = 2.71828183$

# REVIEW ONLY

### Quadratic Formula

When given a formula in the form of a quadratic equation  $\rightarrow$

The solution can be derived using the quadratic formula  $\rightarrow$

## MATHEMATICAL SYMBOLS

+	plus	>	greater than	○	circle
-	minus	<	less than	∩	arc of circle
±	plus or minus	≠	not equal to	∪	union
×	multiplied by	≡	is the same as	□	rectangle
÷	divided by	∞	infinity	▭	parallelogram
=	equal to	:	is to (ratio)	△	triangle
≠	not equal to	::	as (proportion)	∠	angle
≈	nearly equal to	π	pi (-3.14159)	⊥	right angle
$\sqrt{x}$	square root of x	∴	therefore	⊥	perpendicular
$\sqrt[n]{x}$	nth root of x	∵	because		parallel
%	percentage	x	absolute value of x	°	degrees
Σ	sum of	...	and so on	'	minutes

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