

No Calculator

3 FACTOR BASICS

What are the solutions of the quadratic equation

$4x^2 - 8x - 12 = 0$?

FACTOR OUT 4

- A) $x = -1$ and $x = -3$
- B) $x = -1$ and $x = 3$
- C) $x = 1$ and $x = -3$
- D) $x = 1$ and $x = 3$

$4(x^2 - 2x - 3) = 0$
 THEN FACTOR EQUATION
 $x^2 - 2x - 3 = 0$
 $(x-3)(x+1) = 0$
 $x = 3$ $x = -1$

10 PLUG IN NUMBERS

If $a^2 + b^2 = z$ and $ab = y$, which of the following is equivalent to $4z + 8y$?

- A) $(a + 2b)^2$
- B) $(2a + 2b)^2$
- C) $(4a + 4b)^2$
- D) $(4a + 8b)^2$

$a^2 + b^2 = z$ $ab = y$
 $2^2 + 2^2 = 4$ $(2)(2) = 4$
 $4 + 4 = 8$
 $4z + 8y = 4(8) + 8(4) = 32 + 32 = 64$
 $(2a + 2b)^2 = (2(2) + 2(2))^2 = (4 + 4)^2 = 64$ MATCH!
 REMINDER $4^{\frac{3}{2}} = \sqrt[2]{4^3} = \sqrt[2]{64} = 8$
 $4^{\frac{1}{2}} = \sqrt[2]{4} = 2$

12 EXPONENT RULES

Which of the following is equivalent to $9^{\frac{3}{4}}$?

- A) $\sqrt[3]{9}$
- B) $\sqrt[4]{9}$
- C) $\sqrt{3}$
- D) $3\sqrt{3}$

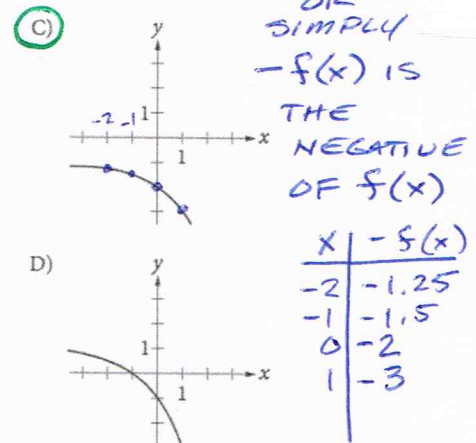
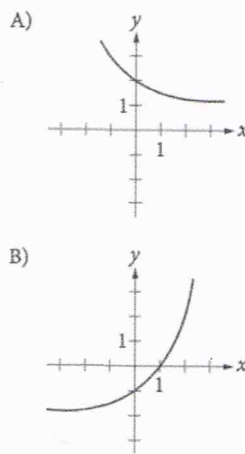
$9^{\frac{3}{4}} = \sqrt[4]{9^3} = \sqrt[4]{729}$
 $4^{\frac{3}{2}} = \sqrt[2]{4^3} = \sqrt[2]{64} = 8$
 TEST ANSWERS
 $(3\sqrt{3})^4 = 3\sqrt{3} \cdot 3\sqrt{3} \cdot 3\sqrt{3} \cdot 3\sqrt{3} = 27 \cdot 27 = 729$ A MATCH!
 $81\sqrt{3} \cdot 3\sqrt{3} = 243 \cdot 3 = 729$

14 GET FAMILIAR! REMEMBER $f(x) = y$

$f(x) = 2^x + 1$

The function f is defined by the equation above.

Which of the following is the graph of $y = -f(x)$ in the xy -plane?



5 SOLVE FOR K

$\sqrt{k+2} - x = 0$

In the equation above, k is a constant. If $x = 9$, what is the value of k ?

- A) 1
- B) 7
- C) 16
- D) 79

$\sqrt{k+2} - 9 = 0$
 $\sqrt{k+2} = 9$
 $k+2 = 81$
 $k = 79$

6 SIMPLE ADDITION

Which of the following is equivalent to the sum of the expressions $a^2 - 1$ and $a + 1$?

- A) $a^2 + a$
- B) $a^3 - 1$
- C) $2a^2$
- D) a^3

$a^2 - 1 + a + 1$ OR $a^2 - 1 + a + 1$
 $a^2 + a$ $a^2 + a - 1 + 1$
 $a^2 + a$

9 PLUG IN AND SOLVE

$y = x^2$
 $2y + 6 = 2(x + 3)$

If (x, y) is a solution of the system of equations above and $x > 0$, what is the value of xy ?

- A) 1
- B) 2
- C) 3
- D) 9

$2x^2 + 6 = 2x + 3$
 $2(x^2 + 3) = 2(x + 3)$
 $x^2 + 3 = x + 3$
 $x^2 = x$ so $y = 1$
 $x = \frac{x}{x} = 1$ $xy = 1 \cdot 1 = 1$

19 DENOMINATOR BASICS

$\frac{2x+6}{(x+2)^2} - \frac{2}{x+2} = \frac{2x+6}{(x+2)^2} - \frac{2x+4}{(x+2)^2}$

The expression above is equivalent to $\frac{a}{(x+2)^2}$,

where a is a positive constant and $x \neq -2$.

What is the value of a ?

$\frac{2}{(x+2)^2}$ $a = 2$

With Calculator

8 **RIHANNA'S WORK, WORK, WORK**

Which of the following is an equivalent form of $(1.5x - 2.4)^2 - (5.2x^2 - 6.4)$? *CAREFULLY*

$2.25x^2 - 7.2x + 5.76$

- A) $-2.2x^2 + 1.6$
- B) $-2.2x^2 + 11.2$
- C) $-2.95x^2 - 7.2x + 12.16$
- D) $-2.95x^2 - 7.2x + 0.64$

*REMEMBER!
CHANGE SIGN AND
ADD WHEN SUBTRACTING
NEGATIVE #S*

10 **TRANSLATE THE SOLVE FOR M**

The density d of an object is found by dividing the mass m of the object by its volume V . Which of the following equations gives the mass m in terms of d and V ?

- A) $m = dV$
- B) $m = \frac{d}{V}$
- C) $m = \frac{V}{d}$
- D) $m = V + d$

$d = \frac{m}{V}$
 $dV = m$

21 **PLUG IN #S TRY A FEW**

$\frac{a-b}{a} = c$
 $\frac{-2-3}{-2} = \frac{-5}{-2} = +2.5$

In the equation above, if a is negative and b is positive, which of the following must be true?

- A) $c > 1$
- B) $c = 1$
- C) $c = -1$
- D) $c < -1$

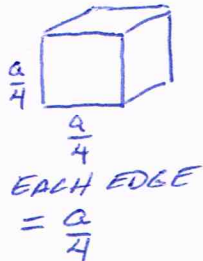
$\frac{-5-1}{-5} = \frac{-6}{-5} = +1.2$
 $\frac{-2-2}{-2} = \frac{-4}{-2} = +2$

26 **CUBE BASICS**

The surface area of a cube is $6\left(\frac{a}{4}\right)^2$, where a is a positive constant. Which of the following gives the perimeter of one face of the cube?

- A) $\frac{a}{4}$
- B) a
- C) $4a$
- D) $6a$

*REMEMBER!
CUBE'S S.A. IS $6 \times S^2$
THEY'RE BASICALLY SHOWING EXACTLY THE SAME!*



30 **RECOGNITION REACTION**

$y = x^2 - a$

In the equation above, a is a positive constant and the graph of the equation in the xy -plane is a parabola. Which of the following is an equivalent form of the equation?

- A) $y = (x+a)(x-a)$ = END WILL EQUAL $-a^2$
- B) $y = (x + \sqrt{a})(x - \sqrt{a})$ = END WILL EQUAL $-a$
- C) $y = \left(x + \frac{a}{2}\right)\left(x - \frac{a}{2}\right)$ = END WILL EQUAL $-\frac{a^2}{4}$
- D) $y = (x+a)^2$ = END WILL EQUAL $+a^2$

34 **PLUG IN AND SOLVE**

In the xy -plane, the point $(2, 5)$ lies on the graph of the function f . If $f(x) = k - x^2$, where k is a constant, what is the value of k ?

$f(x) = k - x^2$
 $f(2) = k - 2^2 = 5$
 $= k - 4 = 5$
 $k = 9$

35 **DRAW, LABEL, AND SOLVE**

A landscaper is designing a rectangular garden. The length of the garden is to be 5 feet longer than the width. If the area of the garden will be 104 square feet, what will be the length, in feet, of the garden?

$x+5$
 x
AREA = $LW = 104$
 $x(x+5) = 104$
 $x^2 + 5x = 104$
 $x^2 + 5x - 104 = 0$
FACTOR
 $(x+13)(x-8) = 0$
 $x = -13$ $x = 8$
 $L = 13$ $W = 8$