

Aim: How do we prepare for the college math placement exam (College Board College Algebra)?

Get Ready: Begin Review Guide.

1. $2^{\frac{5}{2}} - 2^{\frac{3}{2}}$ ← SAME BASE, COMMON FACTOR

A. $2^{\frac{1}{2}}$
 B. 2
 C. $2^{\frac{3}{2}}$
 D. $2^{\frac{5}{2}}$
 E. 2^2

$$= 2^{\frac{3}{2}} - 2^{\frac{3}{2}}$$

$$= 2^{\frac{3}{2}} (2^{\frac{2}{2}} - 1)$$

↑
 FACTOR OUT $2^{\frac{3}{2}}$

$$= 2^{\frac{3}{2}} (2 - 1) = 2^{\frac{3}{2}} (1)$$

$$= 2^{\frac{3}{2}}$$

OR

$$\sqrt{2^5} - \sqrt{2^3} = \sqrt{32} - \sqrt{8}$$

$$= \sqrt{16} \sqrt{2} - \sqrt{4} \sqrt{2} = 4\sqrt{2} - 2\sqrt{2}$$

$$= 2\sqrt{2} = 2 \cdot 2^{\frac{1}{2}} = 2^{1+\frac{1}{2}}$$

$$= 2^{\frac{3}{2}}$$

2. If $a \neq b$ and $\frac{1}{x} + \frac{1}{a} = \frac{1}{b}$, then $x =$

A. $\frac{1}{b} - \frac{1}{a}$ $\frac{1}{x} = \frac{1}{b} - \frac{1}{a}$
 B. $b - a$
 C. $\frac{1}{ab}$ $\frac{1}{x} = \left(\frac{a}{a}\right) \frac{1}{b} - \frac{1}{a} \left(\frac{b}{b}\right)$
 D. $\frac{a-b}{ab}$ $\frac{1}{x} = \frac{a}{ab} - \frac{b}{ab}$
 E. $\frac{ab}{a-b}$

OR

$$\frac{1}{x} = \frac{a-b}{ab}$$

$$(a-b)x = ab$$

$$x = \frac{ab}{a-b}$$

$$x = \frac{ab}{a-b}$$

3. The graph of which of the following equations is a straight line parallel to the graph of $y = 2x$?
- A. $4x - y = 4$ $y = 4x + 4$ $m = 4$
 B. $2x - 2y = 2$ $2y = 2x - 2$
 C. $2x - y = 4$ $y = 2x - 4$ $m = 2$
 D. $2x + y = 2$ $y = -2x + 2$ $m = -2$
 E. $x - 2y = 4$ $y = \frac{1}{2}x - 2$ $m = \frac{1}{2}$

PARALLEL → SAME SLOPE

$$y = 2x$$

↑
 $m = 2$

PERPENDICULAR
 "opposite reciprocal"

4. An apartment building contains 12 units consisting of one- and two-bedroom apartments that rent for \$360 and \$450 per month, respectively. When all units are rented, the total monthly rental is \$4,950. What is the number of two-bedroom apartments?
- A. 3
 B. 4
 C. 5
 D. 6
 E. 7

Let $x = 1$ -BED
 $y = 2$ -BED

$$x + y = 12$$

$$360x + 450y = 4950$$

$$x = 12 - y$$

$$360(12 - y) + 450y = 4950$$

$$4320 - 360y + 450y = 4950$$

$$90y = 630$$

$$y = 7$$

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5. If $\log_{10} x = 3$, then $x =$

- A. 3^{10}
- B. 1,000**
- C. 30
- D. $\frac{10}{3}$
- E. $\frac{3}{10}$

$\log_{10} x = 3$

$10^3 = x$ FOLLOWED BY "3" ZEROS

1000 = x

7. If $f(x) = 2x + 1$ and $g(x) = \frac{x-1}{2}$, then $f(g(x)) =$

- A. x**
 - B. $\frac{x-1}{4x+2}$
 - C. $\frac{4x+2}{x-1}$
 - D. $\frac{5x+1}{2}$
 - E. $\frac{(2x+1)(x-1)}{2}$
- work RIGHT TO LEFT
- PLUG g INTO f

$$f\left(\frac{x-1}{2}\right) = 2\left(\frac{x-1}{2}\right) + 1$$

$$= x - 1 + 1 = x$$

$f(x)$ & $g(x)$ ARE INVERSE FUNCTIONS

6. An equation of the line that contains the origin and the point (1, 2) is

- A. $y = 2x$**
- B. $2y = x$
- C. $y = x - 1$
- D. $y = 2x + 1$
- E. $\frac{y}{2} = x - 1$

(0, 0) ← ORIGIN

(1, 2) ← POINT

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{2 - 0}{1 - 0} = \frac{2}{1} = 2$$

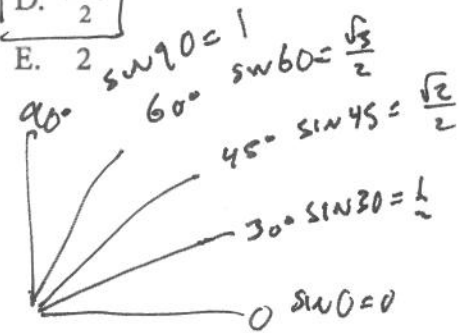
$y = mx + b \rightarrow b = 0$

$y = 2x$

↑ THROUGH ORIGIN, y-INTERCEPT = 0

8. If θ is an acute angle and $\sin \theta = \frac{1}{2}$, then $\cos \theta =$

- A. -1
 - B. 0
 - C. $\frac{1}{2}$
 - D. $\frac{\sqrt{3}}{2}$**
 - E. 2
- $\sin \theta = \frac{1}{2}$



$\sin 30 = \frac{1}{2}$ ← COMPLEMENTARY ANGLES

$\cos 30 = \sin 60 = \frac{\sqrt{3}}{2}$

COFUNCTIONS

Solutions: 1. C 2. E 3. C 4. E
5. b 6. A 7. A 8. D