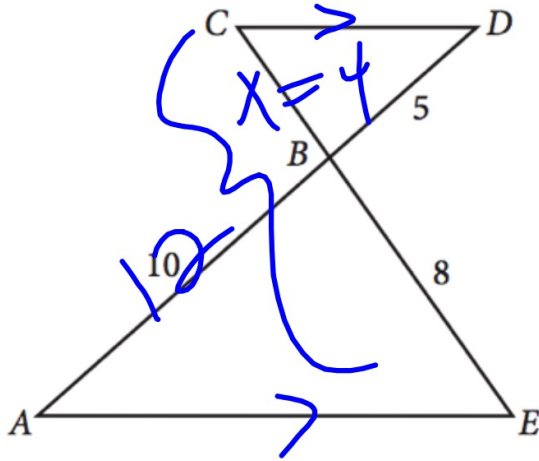


1.)



$$\frac{10}{5} = \frac{8}{x}$$

$$10x = 40$$

$$x = 4$$

In the figure above, $\overline{AE} \parallel \overline{CD}$ and segment AD intersects segment CE at B . What is the length of segment CE ?

2.) What is the sum of all values of m that satisfy $2m^2 - 16m + 8 = 0$

A) -8

B) $-4\sqrt{3}$

C) $4\sqrt{3}$

D) 8

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{16 \pm \sqrt{192}}{4}$$

$$\frac{16 \pm 8\sqrt{3}}{4} = 4 \pm 2\sqrt{3}$$

$$4 + 2\sqrt{3} + 4 - 2\sqrt{3} = 8$$

3.) If $\frac{x^{a^2}}{x^{b^2}} = x^{16}$, $x > 1$, and $a + b = 2$, what is the value of $a - b$?

A) 8

B) 14

C) 16

D) 18

$$\begin{aligned} a^2 - b^2 &= 16 \\ &= (a+b)(a-b) \\ 2 \times &= 16 \\ &= 8 \end{aligned}$$

4.) The graph of a line in the xy -plane has slope 2 and contains the point $(1, 8)$. The graph of a second line passes through the points $(1, 2)$ and $(2, 1)$. If the two lines intersect at the point (a, b) , what is the value of $a + b$?

A) 4

B) 3

C) -1

D) -4

$$\begin{aligned} m &= -1 \\ y - y_1 &= m(x - x_1) \\ y - 8 &= 2(x - 1) \Rightarrow y = 2x + 6 \\ y - 2 &= -1(x - 1) \Rightarrow y = -x + 3 \\ -x + 3 &= 2x + 6 \\ 3 &= 3x + 6 \\ -3 &= 3x \quad x = -1 \\ y &= 4 \end{aligned}$$

5.) Which of the following equations has a graph in the xy-plane for which y is always greater than or equal to -1?

~~A) $y = |x| - 2$~~

~~B) $y = x^2 - 2$~~

C) $y = (x - 2)^2$

D) $y = x^3 - 2$

6.) When 4 times the number x is added to 12, the result is 8. What number results when 2 times x is added to 7?

A) -1

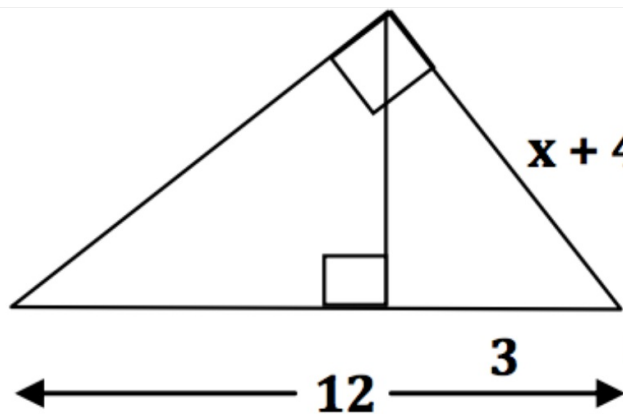
B) 5

C) 8

D) 9

$$\begin{aligned} 4x + 12 &= 8 \\ 4x &= -4 \\ x &= -1 \end{aligned}$$

Handwritten work for question 6 shows the solution for x. The equations are written in blue ink. Arrows indicate the substitution of x = -1 into the second equation: $2x + 7$ becomes $-2 + 7$.



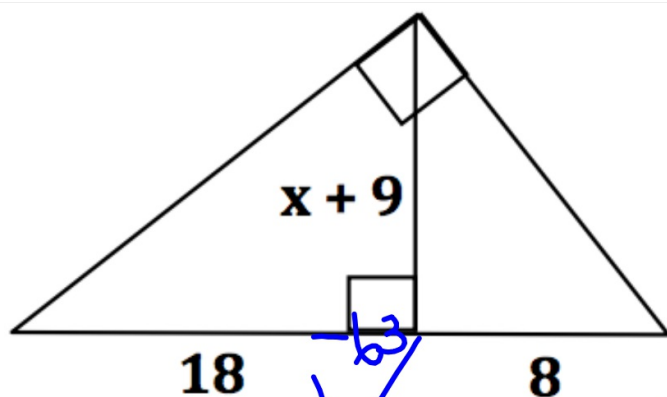
$$\frac{3}{x+4} = \frac{x+4}{12}$$

$$x^2 + 8x + 16 = 36$$

$$x^2 + 8x - 20 = 0$$

$$(x+10)(x-2) = 0$$

$$x = -10, 2$$



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

$$\frac{8}{x+9} = \frac{x+9}{18}$$

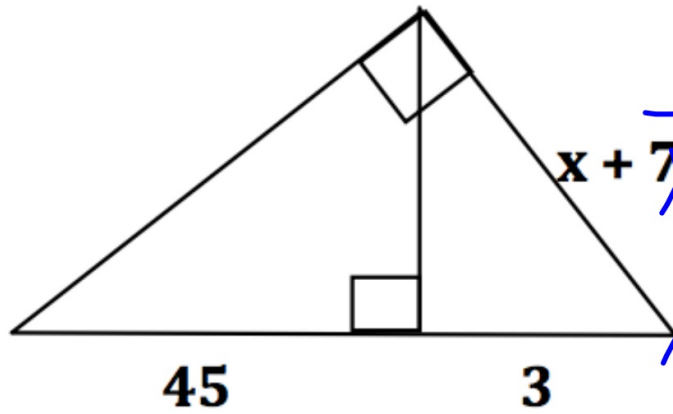
$$x^2 + 18x + 81 = 144$$

$$x^2 + 18x - 63 = 0$$

$$(x+21)(x-3) = 0$$

$$x = -21, 3$$

~~$$\frac{21}{18} = \frac{x}{-3}$$~~



$$\frac{3}{x+7} = \frac{x+7}{48}$$

$$x^2 + 14x + 49 = 144$$

$$x^2 + 14x - 95 = 0$$

$$(x - 5)(x + 19) = 0$$

$$x = 5, -19$$