1. The number of states that joined the United States between 1776 and 1849 is twice the number of states that joined between 1850 and 1900. If 30 states joined the United States between 1776 and 1849 and x states joined between 1850 and 1900, which of the following equations is true?

A) $30x = 2$

B) $2x = 30$

C) $\frac{x}{2} = 30$

D) $x + 30 = 2$

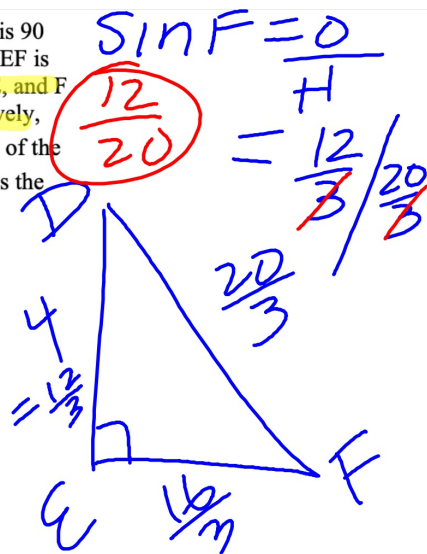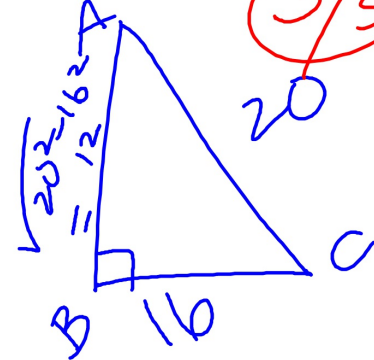2. $\begin{cases} 2x - 3y = -14 \\ 3x - 2y = -6 \end{cases}$

If (x, y) is a solution to the system of equations above, what is the value of x − y?

A) -20

B) -8

C) -4

D) 8

Handwritten work:

$\begin{array}{l} 2x - 3y = -14 \quad 3 \\ 3x - 2y = -6 \quad 2 \end{array}$

$6x - 9y = -42$
$6x - 4y = -12$
$-5y = -30$
$y = 6$
$x = 2$
$2 - 6 = -4$

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3. In triangle, ABC the measure of angle B is 90 degrees, BC = 16, and AC = 20. Triangle DEF is similar to triangle ABC, where vertices D, E, and F correspond to vertices A, B, and C, respectively, and each side of triangle DEF is $\frac{1}{3}$ the length of the corresponding side of triangle ABC. What is the value of sin F?

Handwritten work:

$\sin F = \frac{O}{H}$

$\frac{12}{20} = \frac{12}{20}$

$= \frac{12}{3} / \frac{20}{3}$

$3/5$

$\frac{20}{3}$

$\sqrt{20^2 - 16^2} = 12$

20

4

$= 12/3$

16/3

B   16

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4. $(\sqrt{x-a})^2 = (x-4)^2$

If a = 2, what is the solution set of the equation above?

A) {3, 6}

B) {2}

C) {3}

D) {6}

Handwritten work:

$x - a = x^2 - 8x + 16$
$x - 2 = x^2 - 8x + 16$
$0 = x^2 - 9x + 18$
$x = 6, 3$

18 -6 -3 -9

$\sqrt{6 - 2} = 6 - 4$
$\sqrt{2} = 2$

5. $x = 2y + 5$
    $y = (2x - 3)(x + 9)$

How many ordered pairs (x, y) satisfy the system of
equations shown above?

A) 0

B) 1

C) 2

D) Infinitely many

$(70)^2 = 4(8)(98) = +$

$y = (2(2y+5) - 3)(2y+5+9)$

$(4y + 10 - 3)(2y + 14)$

$(4y + 7)(2y + 14)$

$8y^2 + 56y + 14y + 98$

$8y^2 + 70y + 98$