

Algebra I Team Solutions

#1

$$-\frac{19}{45}$$

$$\frac{1}{5} + \frac{3}{8}A = \frac{3}{4}$$

$$\frac{3}{8}A = \frac{15}{20} - \frac{4}{20}$$

$$\frac{3}{8}A = \frac{11}{20} \quad | \cdot 2$$

$$A = \frac{11}{20} \cdot \frac{8}{3} = \frac{22}{15}$$

$$.9B - .7 = 4.2 \quad | + .7 \quad \frac{C}{6} - \frac{1}{3} = C - 24$$

$$.9B = 4.9$$

$$B = \frac{49}{9}$$

$$4C - 8 = C - 24$$

$$\frac{16}{-3} = \frac{-3C}{-3}$$

$$\frac{16}{-3} = C$$

$$(-3) \cdot -\frac{1}{3}(D-2) = \frac{4}{3} \cdot -3$$

$$D-2 = -4$$

$$D = -2$$

$$A+B+C+D =$$

$$\frac{22}{15} + \left(\frac{49}{9} - \frac{48}{9}\right) + -2 =$$

$$\left(\frac{22}{15} + \frac{1}{9}\right) - 2 =$$

$$\frac{66}{45} + \frac{5}{45} - 2$$

$$\frac{71}{45} - \frac{90}{45} = -\frac{19}{45}$$

#2

$$d+h=44$$

1 horse and 43 ducks

$$2d+4h=90$$

$$-2d-2h=-88$$

$$2h=2$$

$$h=1$$

1848

#3 5 min = $\frac{5}{60} = \frac{1}{12}$ of an hour

$$2\frac{1}{3} = \frac{7}{3}\left(\frac{1}{12}\right) + \frac{7}{3}t = \frac{21}{4}t$$

$$\frac{7}{36} = \frac{21}{4}t - \frac{7}{3}t$$

$$1 = \frac{63}{12}t - \frac{28}{12}t$$

$$\frac{12}{35} \cdot \frac{36}{3} = \frac{35}{12}t \cdot \frac{12}{35}$$

$$= \frac{1}{15}t$$

$$\frac{7}{3}\left(\frac{1}{12}\right) + \frac{7}{3}\left(\frac{1}{15}\right)$$

$$\frac{7}{36} + \frac{7}{45}$$

$$\frac{7 \cdot 8 + (7) \cdot 5}{36(45)} = \frac{7 \cdot 55}{22 \cdot 5} = \frac{264}{110} = 1848 \times 10$$

time before full began
Time it took for full to catch up

of an hour

$$x = 22 \quad y = 54$$

A19 I

$$\#4 \quad a \# b = a + b - ab$$

$$2 \# x + 3 \# y$$

$$2 + x - 2x + 3 + y - 3y = 19$$

$$-x - 2y + 5 = 19$$

$$-x - 2y = 14$$

$$3 \# x - 4 \# y = 89$$

$$3 + x - 3x + 4 + y - 4y = 89$$

$$-2x - 3y + 7 = 89$$

$$-2x - 3y = 89$$

$$-2(-x - 2y) = (14) - 2$$

$$2x + 4y = -28$$

$$-2x - 3y = 89$$

$$y = 54$$

$$-x - 2(54) = 14$$

$$-x = 108$$

$$-x = 122$$

$$x = 122$$

$$\#5 \quad (3x+8)(5x+10)(7x+12) - (x+2)(3x+10)(6x+16)$$

$$[(3x+8)(5)(x+2)(7x+12)] - [(x+2)(3x+10)(2)(3x+8)]$$

There are 2 common factors to factor downward

$$(3x+8)(x+2) [5(7x+12)] - 2[3x+10]$$

$$35x + 60 - 6x - 20$$

$$(3x+8)(x+2)(29x+40)$$

$$x^4 - 81 = 0$$

$$\#6 \quad \text{If } x^4 - 1 = 80 \quad x < 0$$

$$(x^2 - 1)(x^2 + 1)$$

$$(x-1)(x+1)(x^2+1) = 0$$

$$x = -1 \text{ since } x < 0$$

$$-(-1)^3 - 2(-1)^2 + 5(-1) - 12$$

$$1 - 2 - 5 - 12$$

$$1 - 19 = -18$$

Alg I

#7 $\frac{J}{B} = \frac{7}{8}$
 $J = \frac{7}{8}B$

$\frac{J+2}{B+2} = \frac{8}{9}$

$9(J+2) = 8(B+2)$

$9J + 18 = 8B + 16$

$\frac{9}{1} \cdot \frac{7}{8}B + 18 = 8B + 16$

$2 = 8B - \frac{63}{8}B$

$2 = 8B - 7\frac{7}{8}B$

$2 = \frac{1}{8}B$

$(a-3b-3)(a-3b+3) \quad 16 = B \quad J = 14$

$(a-3b)^2 - 9$

$3(a^2 + 9b^2)$

$3(a-3b)$

#8

$a^2 - 6ab + 9b^2 - 9$

$a - 3b - 3$

$\frac{3a - 9b}{3a - 9b + 9}$

$a^4 - 81b^4$

$3a^2 + 27b^2$

$3a - 9b + 9$

$(a^2 - 9b^2)(a^2 + 9b^2)$

$a - 3b - 3$

$3(a-3b+3)$

$(a-3b)(a+3b)$

$= \frac{3}{a+3b}$

14 2/21

#9 $H + B = T$

$H = T + \frac{1}{7}B \rightarrow H = 4 + \frac{1}{7}B$

$\frac{100}{21} + \frac{12}{21} + 4$

$B = H + \frac{1}{7}T$

$B = H + \frac{4}{7}$

$\frac{100}{21} + \frac{12}{21}$

$\frac{112}{21} + \frac{84}{21}$

$H = 4 + \frac{1}{7}(H + \frac{4}{7})$

$\frac{276}{21} =$

$H = 4 + \frac{1}{7}H + \frac{4}{49}$

14 2/21 m

$-\frac{1}{7}H = -\frac{1}{7}H$

$\frac{6}{7}H = 4\frac{4}{49}$

$\frac{6}{7}H = \frac{196 + 4}{49}$

$\frac{7}{6} \cdot \frac{6}{7}H = \frac{200}{49} \cdot \frac{7}{6}$

$H = \frac{100}{21}$

Algebra I Team

#10

$$\begin{aligned} &1 - x^2 - 2xy - y^2 \\ &1 - (x^2 + 2xy + y^2) \\ &1 - (x+y)^2 \\ &[1 - (x+y)][1 + (x+y)] \\ &[1 - x - y][1 + x + y] \end{aligned}$$

#15

$$\begin{aligned} &3(x^2 - \frac{7}{3}x - 2) = 0 \cdot 3 \\ &3x^2 - 7x - 6 = 0 \\ &3x^2 - 9x + 2x - 6 = 0 \\ &(3x+2)(x-3) = 0 \\ &x = -\frac{2}{3} \quad x = 3 \end{aligned}$$

#11 Since $a > 3$ $3 - a < 0$

and the " $>$ " in step 4 should be switched to " $<$ " because signs change when you divide by neg.

$$\begin{aligned} \#12 & \frac{(x+2)(x^2-2x+4)(x-2)(x^2+2x+4)}{(x^3+8)(x^3-8)} \\ & x^6 - 64 \end{aligned}$$

$$\#13 \quad (3\frac{1}{2} + 4)t = 25$$

$$7\frac{1}{2}t = 25$$

$$\frac{2}{15} \cdot \frac{15}{2}t = 25 \cdot \frac{2}{15}$$

$$t = \frac{10}{3} \cdot 60^3 = \frac{600}{3} = 200 \text{ men}$$

(3 hrs 20 min)

$$\#14 \quad .05(80) = .04(80+y)$$

$$4 = 3.2 + .04y$$

$$.8 = .04y$$

$$20 = y$$