

Name: Key Show work needed to justify your answer. Date: \_\_\_\_\_

HW # 32a: Algebra 1 - Standard 20 - Inverses of Linear Functions 5 points

Find the inverse of each function.

16.  $f(x) = 8x - 5$   
 $y = 8x - 5$   
 $x = \frac{y+5}{8}$   
 $x+5 = 8y$   
 $\frac{x+5}{8} = y$   
 $f^{-1}(x) = \frac{x+5}{8}$  or  $f^{-1}(x) = \frac{1}{8}x + \frac{5}{8}$

17.  $f(x) = 6(x + 7)$   
 $y = 6x + 42$   
 $x = \frac{y}{6} + 7$   
 $x - 42 = 6y$   
 $\frac{x-42}{6} = y$   
 $f^{-1}(x) = \frac{x-42}{6}$  or  $f^{-1}(x) = \frac{1}{6}x - 7$

18.  $f(x) = \frac{3}{4}x + 9$   
 $y = \frac{3}{4}x + 9$   
 $x = \frac{4}{3}y + 12$   
 $x - 9 = \frac{3}{4}y$   
 $\frac{4}{3}(x-9) = y$   
 $f^{-1}(x) = \frac{4}{3}x - 12$

20.  $f(x) = \frac{3x+5}{4}$   
 $y = \frac{3x+5}{4}$   
 $x = \frac{4y-5}{3}$   
 $4x = 3y + 5$   
 $4x - 5 = 3y$   
 $\frac{4x-5}{3} = y$   
 $f^{-1}(x) = \frac{4x-5}{3}$

24. **SEASON PASS** A season pass to an amusement park costs \$70 per family member plus an additional \$50 fee for parking. The function  $C(x) = 70x + 50$  represents the total cost of the season pass for a family, where  $x$  is the number of family members on the season pass.

a. Find the inverse function,  $C^{-1}(x)$ .

$y = 70x + 50$   
 $x = \frac{y-50}{70}$   
 $x - 50 = 70y$   
 $\frac{x-50}{70} = y$

b. What do  $x$  and  $C^{-1}(x)$  represent in the context of the inverse function?

c. How many family members purchased a season pass to the amusement park if the total charge was \$470?

(a)  $C^{-1}(x) = \frac{x-50}{70}$

(b)  $x$  now represents the total cost and  $C^{-1}(x)$  is # of family members.

(c)  $C^{-1}(470) = \frac{470-50}{70} \rightarrow C^{-1}(470) = \frac{420}{70} = \boxed{6}$