AAT

HW 52

p244 # 1-4, 7-12, 15-20

1. inverse

2. f^{-1}

3. range, domain

4. $y = x$

7. $y = 6x$

$x = 6y$

$\frac{x}{6} = y$

$\boxed{f^{-1}(x) = \frac{x}{6}}$

$f(f^{-1}(x)) = 6\left(\frac{x}{6}\right) = x$

$f^{-1}(f(x) = \frac{6x}{6} = x$

8. $x = \frac{1}{3}y$

$3x = y$

$\boxed{f^{-1}(x) = 3x}$

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

$f^{-1}(f(x)) = 3\left(\frac{1}{3}x\right) = x$

9. $x = y + 9$

$x - 9 = y$

$f^{-1}(x) = x - 9$

$f(f^{-1}(x)) = x - 9 + 9 = x$

$f^{-1}(f(x)) = x + 9 - 9 = x$

10. $x = y - 4$

$x + 4 = y$

$\boxed{f^{-1}(x) = x + 4}$

$f(f^{-1}(x)) = x + 4 - 4 = x$

$f^{-1}(f(x)) = x - 4 + 4 = x$

11. $x = 3y + 1$

$\frac{x-1}{3} = y$

$\boxed{f^{-1}(x) = \frac{x-1}{3}}$

$f(f^{-1}(x)) = 3\left(\frac{x-1}{3}\right) + 1$

$= x$

$f^{-1}(f(x)) = \frac{3x+1-1}{3} = x$

12. $x = \frac{y-1}{5}$

$5x + 1 = y$

$\boxed{f^{-1}(x) = 5x + 1}$

$f(f^{-1}(x)) = \frac{5x+1-1}{5} = x$

$f^{-1}(f(x)) = 5\left(\frac{x-1}{5}\right) + 1 = x$

15. c

16. b

17. a

18. d

19. $f(g(x)) = -\frac{7}{2}\left(-\frac{2x+6}{7}\right) - 3$

$= \frac{2x+6}{2} - 3$

$= x$

$g(f(x)) = -\frac{2(-7/2x-3)\overline{+}6}{7}$

$= \frac{7x+6-6}{7}$

$= x$

yes.

20a $f(g(x)) = \frac{4x+9-9}{4} = x$

$g(f(x)) = 4\left(\frac{x-9}{4}\right)+9 = x$

yes.