

## Chapter Test

T1. Exponential

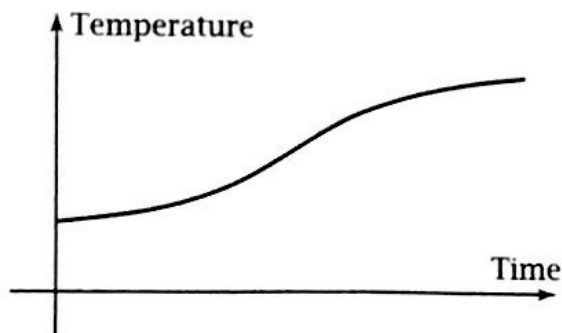
T2. Linear

T3. Polynomial (quadratic)

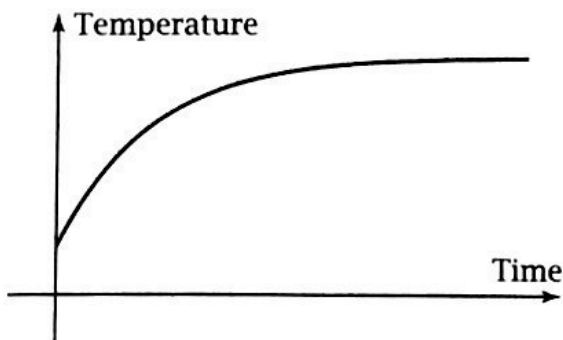
T4. Power

T5. All except T3. They are invertible; that is, their inverses are also functions.

T6. Answers will vary.



or



T7. Odd

T8. Neither

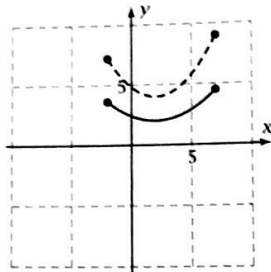
T9. Horizontal dilation by 2;  $g(x) = f\left(\frac{x}{2}\right)$

T10. Horizontal translation by  $-1$ , vertical translation by  $+5$ ;  
 $g(x) = f(x + 1) + 5$

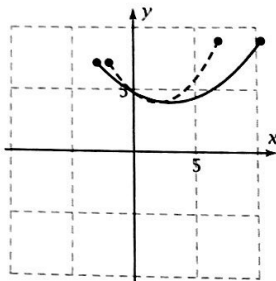
T11. Horizontal translation by  $+6$ , vertical dilation by 2;  
 $g(x) = 2 \cdot f(x - 6)$

T12. Domain:  $-2 \leq x \leq 7$ ; range:  $4 \leq y \leq 9$

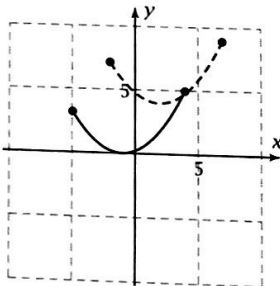
T13. Vertical dilation by  $\frac{1}{2}$



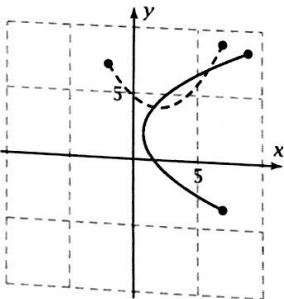
T14. Horizontal dilation by  $\frac{3}{2}$



T15. Horizontal translation by  $-3$ , vertical translation by  $-4$



T16. Reflection through the line  $y = x$



T17. The graph fails the vertical line test. (The pre-image graph fails the horizontal line test—it is not one-to-one.)

T18.  $f(g(3)) = f((3)^2 - 4) = f(5) = \sqrt{5}$ ;  
 $g(f(3)) = g(\sqrt{3}) = (\sqrt{3})^2 - 4 = -1$ ;  
 $f(g(1)) = f((1)^2 - 4) = f(-3)$ , which is not defined, because  $-3$  is not in the domain of  $f$ .

T19. Horizontal translation by  $+4$ , vertical translation by  $+5$ , and vertical dilation by 3 of  $\frac{x}{|x|}$ ;  $y = 3 \cdot \frac{x-4}{|x-4|} + 5$

T20.  $L(x)$  varies proportionately to the 0.52 power of  $x$ . Power function.

T21.  $L(150) = 3.2(150)^{0.52} = 43.3288\dots$  If there are 150 wild oat plants per square meter of land, the percentage loss to the wheat crop will be about 43%.

T22. 60% of the crop means a 40% crop loss.  
 Solve  $40 = 3.2x^{0.52}$  to get

$$x = \left(\frac{40}{3.2}\right)^{\frac{1}{0.52}} = 128.6596\dots$$

About 129 plants per square meter.

T23.  $x = 3.2y^{0.52} \Rightarrow y = \left(\frac{x}{3.2}\right)^{\frac{1}{0.52}}$

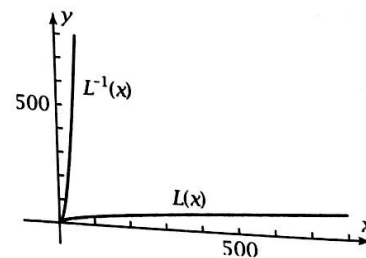
If you know the percentage loss and want to find the number of wild oat plants per square meter.

T24.  $L^{-1}(100) = \left(\frac{100}{3.2}\right)^{\frac{1}{0.52}} = 749.3963\dots$

If the crop loss is 100% (i.e., the total crop is lost), there must have been about 750 wild oat plants per square meter.

T25.  $0 \leq x \leq 750, 0 \leq y \leq 100$

T26.



T27. It passes the vertical line test. (The original function passes the horizontal line test—it is one-to-one.)

T28. Answers will vary.