U1 Quiz Review: Sections 1.6 – 1.7B — Review

Name: _____ HR: _____

Skills: Linear and step functions, parent functions, piecewise functions, shifts and reflections (h, k), stretches and shrinks (a, b), and point mapping. Same skills as the quiz, new numbers.

Template: $g(x)=a\cdot f\left(b(x-h)\right)+k$ **Point mapping:** $(x,y)\to\left(\frac{x}{b}+h, a\,y+k\right)$

OUTSIDE (a, k) → vertical, does what it says. **INSIDE** (b, h) → horizontal, does the OPPOSITE. Negative a → flip over x-axis; negative b → flip over y-axis.

Greatest integer: [[x]] = the greatest integer ≤ x, so [[−1.2]] = −2 (go DOWN on the number line).

Section 1.6 — A Library of Parent Functions

1. Write the linear function f with $f(-2)=7$ and $f(2)=-1$.

2. Let f(x) = [[x]]. Evaluate.

(a) f(4.9) (b) f(−2.3) (c) $f\left(\frac{7}{3}\right)$

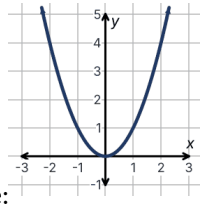
3. Let g(x) = [[x − 1]]. Evaluate.

(a) g(2.5)

(b) g(−0.5)

Name each parent function. Then state its domain and range.

4.

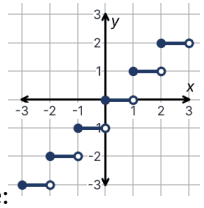


Name:

D:

R:

5.

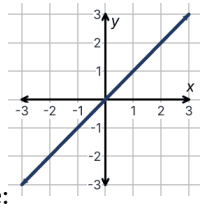


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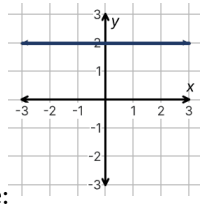


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7.



Name:

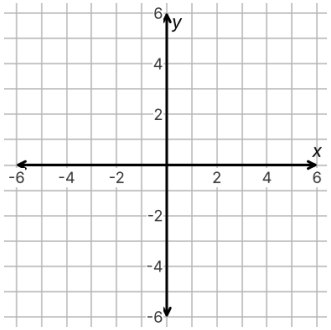
D:

R:

8. Sketch the graph of

$$f(x)=\begin{cases}2x+1, & x\le 0\\ -x+3, & x>0\end{cases}$$

Check the break at x = 0 first: open or closed?



9. For the same f, evaluate.

(a) f(−2) (b) f(0) (c) f(2)

10. Wages A worker earns $15 per hour, plus time-and-a-half for overtime:

$$W(h)=\begin{cases}15h, & 0<h\le 40\\ 22.5(h-40)+600, & h>40\end{cases}$$

Find W(30) and W(46).

Section 1.7A — Shifts & Reflections

Find h, k, and any reflection. Then describe how the graph of g compares to the graph of f.

11. $g(x)=f(x+4)-3$

h = k = reflection?

12. $g(x)=-f(x-2)$

h = k = reflection?

13. $g(x)=f(-x)+5$

h = k = reflection?

14. $g(x)=f(x)-6$

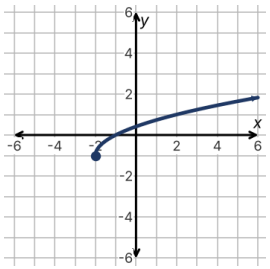
h = k = reflection?

Section 1.7A (continued)

15. Write an equation for $f(x)=x^2$ shifted 3 units right and 2 units up.

16. Write an equation for $f(x)=|x|$ reflected in the x-axis and shifted 1 unit left.

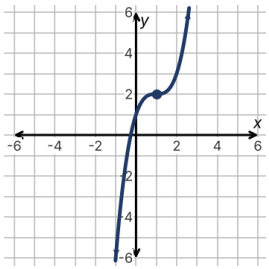
17. Parent: $\sqrt{x}$



h = k =

$g(x)$ =

18. Parent: x^3



h = k =

$g(x)$ =

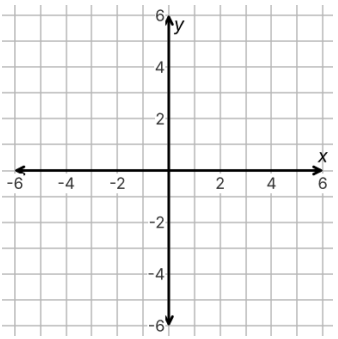
19. Sketch $g(x)=(x-2)^2-3$ and its parent.

Parent:

h =

k =

reflection?



Section 1.7B — Stretches & Shrinks

Find a, b, h, and k. Then describe how the graph of g compares to the graph of f.

20. $g(x)=3f(x)$

a = b = h = k =

21. $g(x)=f\left(\frac{1}{2}x\right)$

a = b = h = k =

22. $g(x)=2f(x+3)-1$

a = b = h = k =

23. $g(x)=-f(4x)+1$

a = b = h = k =

The point (2, 6) is on the graph of f. Find the matching point on the graph of g.

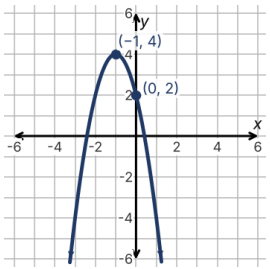
24. $g(x)=\frac{1}{2}f(x)-2$

25. $g(x)=f(2x)$

26. $g(x)=-f(x+1)$

27. $g(x)=3f(x-4)+1$

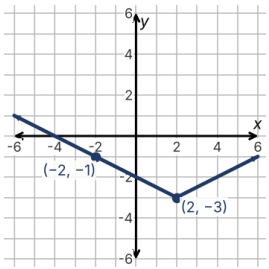
28. Parent: x^2



a = h = k =

$g(x)$ =

29. Parent: $|x|$



a = h = k =

$g(x)$ =

30. Sketch $g(x)=-2|x-1|+3$ and its parent.

a =

h =

k =

Map (−1, 1), (0, 0), (1, 1):

