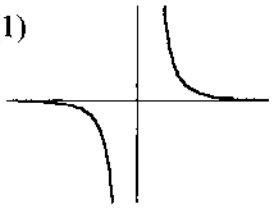
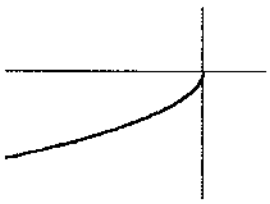
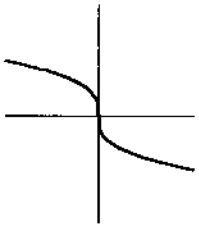
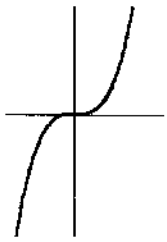
Name Answers quiz power functions - transformations 2015 VERSION 1 28/28

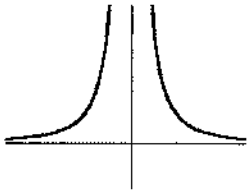
1) Refer to the sketches of power functions below (in the form $y = kx^p$) to answer questions a – k.

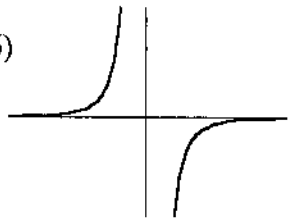
(1) 

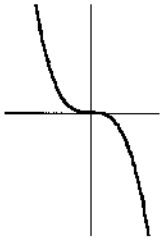
(2) 

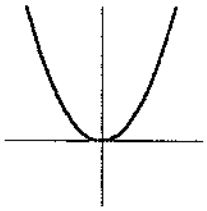
(3) 

(4) 

(5) 

(6) 

(7) 

(8) 

To get credit for a question you must list <u>all</u> of the graphs above which satisfy that question. Write "*none*" if none of the graphs satisfy the question.

$y = -x^{-3}$ ✓ or $y = -\frac{1}{x^{odd}}$ a. Write a possible equation for function #6 above?

1, 3, 4 ✓ b. Which function(s) are concave down for **x<0** and concave up for **x>0**?

none ✓ c. Which function(s) are concave down for their entire domain?

2, 4, 6 ✓ d. Which function(s) are increasing for their entire domain?

2 ✓ e. Which function(s) are concave up and increasing over their entire domain.

1, 5, 6 f. Which function(s) have asymptotes of x=0 and y=0?

3, 4, 7, 8 g. Which function(s) have a domain of all reals?

1, 5, 6 h. In which function(s) is the value of the exponent p negative?

2, 3, 6, 7 i. In which function(s) is the value of the constant k negative?

1, 5, 6 j. In which function(s) is the end behavior as $x \to \infty, y \to 0$ and as $x \to -\infty, y \to 0$.

8 k. In which function(s) is the end behavior as $x \to \infty, y \to \infty$ and as $x \to -\infty, y \to \infty$.

+11

2) Find the value p in the power function $y = kx^p$, which passes through points $(27, -3600)$ and $(64, -4800)$ **(You must show algebraic work to get full credit.)**

$-3600 = k(27)^p$ ✓
$-4800 = k(64)^p$ ✓ → $\frac{-3600}{27^p} = \frac{-4800}{64^p}$ ✓ [5]

$64^p \cdot -3600 = 27^p \cdot -4800$

$\left(\frac{64}{27}\right)^p = \frac{-4800}{-3600} = \frac{4}{3}$ ✓

$p = \frac{1}{3}$ ✓

3) A power function in the form $y = kx^p$, passes through point $\left(\frac{1}{2}, 5\right)$.

Find the value of k given that $p = 4$. **(Show work.)**

$5 = k\left(\frac{1}{2}\right)^4$ ✓ → $5 = \frac{1}{16}k$

$80 = k$ [2]

$k = 80$ ✓

4) Given the power function $f(x)=x^2$ below, use the rules of shifting and stretching to determine the explicit equations of the following.

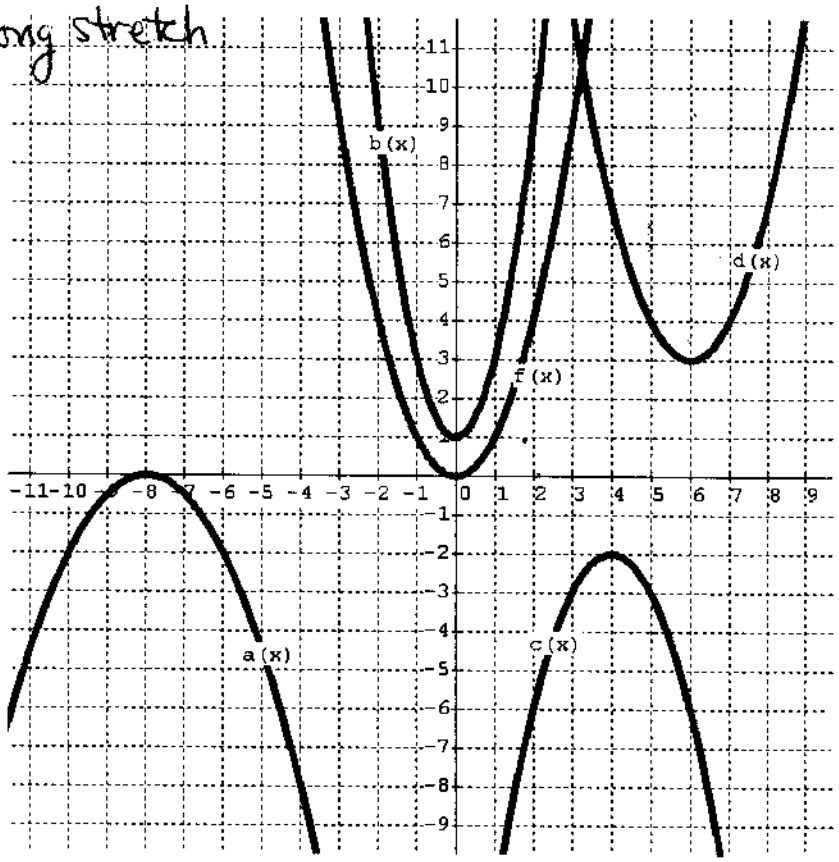
(-1) if no stretch; $(-\frac{1}{2})$ if wrong stretch

a(x)= $-\frac{1}{2}(x+8)^2$ [2]

b(x)= $2x^2 + 1$ [2]

c(x)= $-(x-4)^2 - 2$ [2]

d(x)= $(x-6)^2 + 3$ [2]



5) Find the domain of the function $h(x) = \frac{\sqrt{x+6}}{x}$ [2]

$x \geq -6, \ x \neq 0$ ✓ ✓