Name: _____ Date: _____ Period: _____

CBA 1 Review *may use calculator on all questions*

1. List the domain and range of each of the following parent functions.

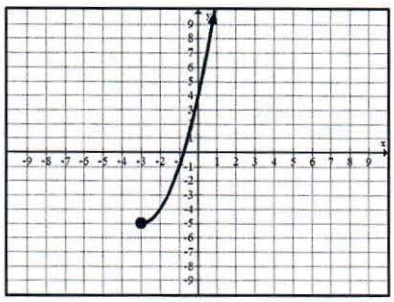
   I. $f(x)=\sqrt{x}$ D: $[0,\infty)$ R: $[0,\infty)$

   II. $f(x)=x^3$ D: $(-\infty,\infty)$ R: $(-\infty,\infty)$

   III. $f(x)=\log x$ D: $(0,\infty)$ R: $(-\infty,\infty)$

   IV. $f(x)=2^x$ D: $(-\infty,\infty)$ R: $(0,\infty)$

2. The graph of $f(x)$ is shown below. What is the range of $f^{-1}(x)$ and how does it compare to the domain of $f(x)$?



Range: of $f^{-1}(x)$ $[-3,\infty)$

The range of $f^{-1}(x)$ is the domain of $f(x)$.

3. Circle ALL of the true statements below.

   I. $y=x$ is an odd function because it is symmetric about the y-axis.

   II. $y=x^2$ is an odd function because it is symmetric about the origin.

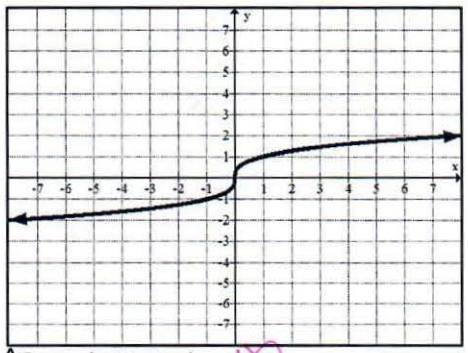
   III. $y=x^3$ is an odd function because it is symmetric about the origin.

   IV. $y=|x|$ is an even function because it is symmetric about the y-axis.

4. The cost of the salt used to fill up the salt shakers on the tables in a restaurant is given by the function $f(x)=8x-2$, where x represents the number of quarts of salt used and f(x) represents the cost. If $f(5a)=90$, what is the value of a? $a=2.3$

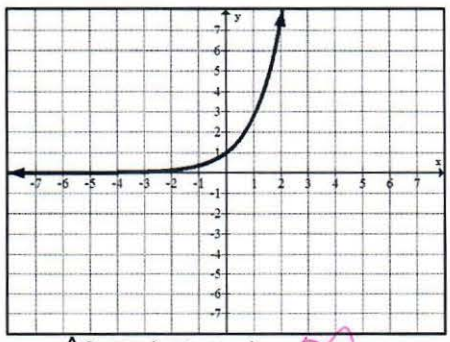
   $90=8(5a)-2$

5. Find the end behavior for each of the graphs.



As $x\to\infty, y\to$ ∞

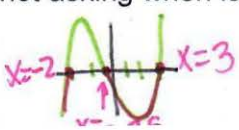
As $x\to-\infty, y\to$ $-\infty$



As $x\to\infty, y\to$ ∞

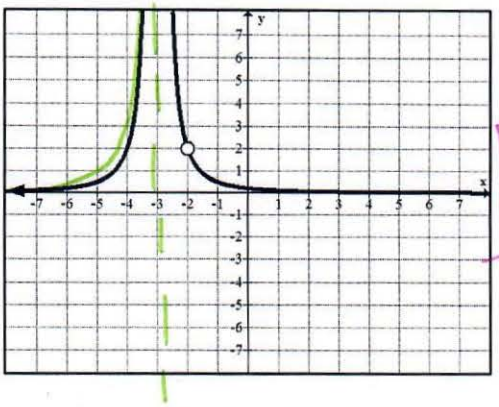
As $x\to-\infty, y\to$ 0

6. Given the function, $f(x)=4x^3-3x^2-25x-6$, on what intervals is $f(x)\le 0$? (Be careful - this question is not asking when is the graph increasing/decreasing!!) ↕ negative (below x-axis)



$(-\infty,-2]\cup[-.25,3]$

7. The graph of a rational function is shown below. Circle all of the key attributes that correctly describe the rational function.



I. The function is increasing on the interval $(-\infty,-3)$ ✓
II. The domain is $(0,\infty)$ (the range is!)
III. The function has vertical asymptotes at $x=-3$. ✓
IV. The function has a horizontal asymptote at $y=2$ (y=0)
V. The function has a removable discountinuity at $x=-2$. ✓

8. The volume of a box can be found with the function *V*, where *x* is the length of the shorted edge of the box.

$$V(x)=8x^3+32x^2+30x$$

What is the length of the shortest edge of the box if it has a volume of 11500 cubic units?

V(x)=11500 use calculator (TABLE) X=10

9. List the transformations of the function $-0.3\,f(x+4)-5$, when $f(x)=x^7$.

Vertical shift: down 5
Horizontal shift: left 4
Vertical stretch/compression: of 0.3 (scale factor)
Horizontal stretch/compression: none
Reflections: over x-axis

10. Graph the function $f(x)=4x^3-3x^2-25x-6$ in your calculator. Circle the statements that are **not** true about the graph.

I. The function has a zero at (-3,0) (positive 3)
II. The function has a zero at (-2,0) true
III. The function is increasing on $(0,\infty)$ increasing $(-\infty,-1.215)\cup(1.715,\infty)$
IV. The function has a domain of all real numbers. true
V. The function has one complex root.

3 roots possible → all visible!

6. Given the function $g(x)=(2x+1)^2-4$ and $g(x)=f(h(x))$, which pair of functions could represent $f(x)$ and $h(x)$?

I. $f(x)=x-4$ and $h(x)=(2x+1)^2$ — I. $f((2x+1)^2)=(2x+1)^2-4=g(x)$ ☺
II. $f(x)=x^2-4$ and $h(x)=2x+1$ — II. $f(2x+1)=(2x+1)^2-4=g(x)$ ☺
III. $f(x)=x-4$ and $h(x)=x^2-4$ — III. $f(x^2-4)=(x^2-4)-4=x^2$ ☹

11. The population of a town from 2010 to 2015 can be represented using the function $f(x)=.35x^4+3.1x^3+250.5x^2-1100x+15000$, where x represents the number of years since 2010. Approximately when will the population reach 70,000? X=14 2010+14

A. About 2011
B. About 2020
C. About 2024
D. About 2015

use calculator, when does y=70000?