MCR3U – Test 3 (Exponential Functions)

K	**/ 17**
T	**/ 8**
C	**/ 8**
A	**/ 13**
Total	**/ 46**

Name: _____

1. Simplify each as much as possible, and give your answer with only positive exponents.

a) $(r^4 r^{-2})^{-\frac{1}{2}} =$

b) $(\frac{2x}{3})^{-2} =$

6 K

c) $\frac{s^{\frac{5}{6}} s^{\frac{-1}{6}}}{s^{\frac{1}{3}}} =$

d) $(2x^{\frac{1}{5}})^7 (x^{\frac{1}{5}})^9 =$

2. Evaluate the following, and give your answer as an **integer or fraction** (do not have exponents in your answer!)

a) $(\frac{9}{7})^{-2} =$

b) $(\frac{27}{-64})^{-\frac{4}{3}} =$

4 K

3. Give the co-ordinates of each of the following for $y = -(\frac{1}{3})^{\frac{1}{4}(x-2)} + 7$

New origin:

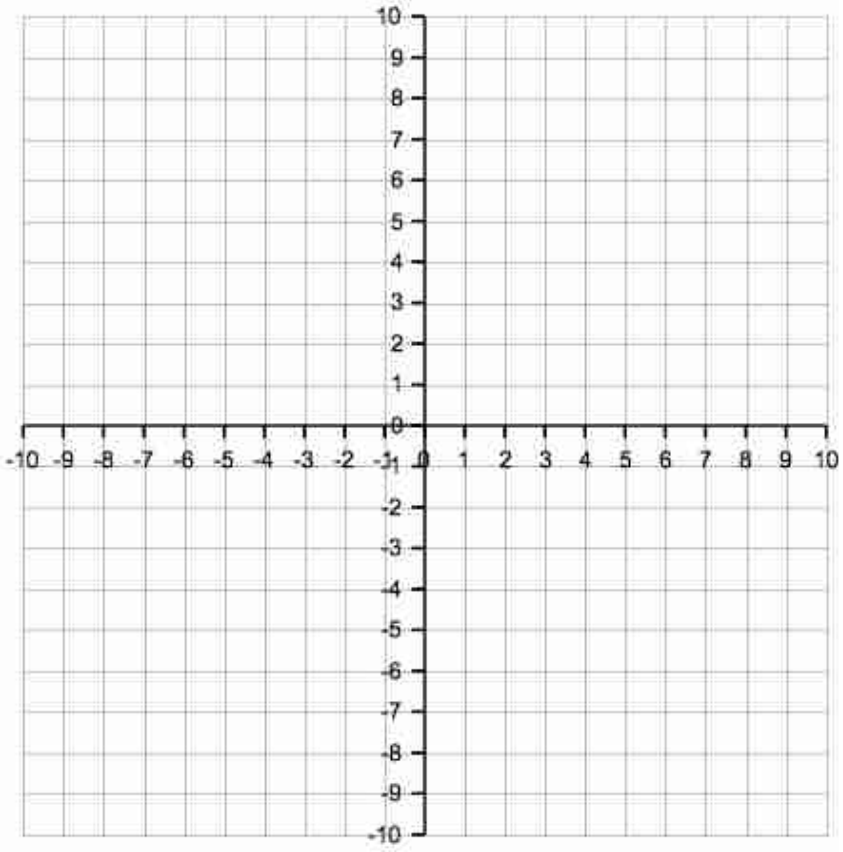
1st point

4 A

a 2nd point:

a 3rd point:

4. Now, graph the function.



3 C

5. Using exponent rules, prove that the graph of $y=2^{x-3}+5$ is the same as the graph of $y=(\frac{1}{4})^{6-2x}+5$.

2 K

6. Using exponent rules, prove that the graph of $y=2(16)^{x+2}+8$ is the same as the graph of $y=(8)2^{4x}+5$.

3 T

7. The half-life of a particular radioactive isotope is 54 hours. $A = A_0(\frac{1}{2})^{\frac{t}{h}}$

a) Write an equation to relate the mass of radioactive material remaining to time (in hours).

1 K

b) Starting with 170 g, what mass will remain in 1 week?

2 K

c) If, after one day (24 hours), a different sample of the material was found to have a mass of 14 mg, what was the initial mass of the sample?

2 K

8. Yesterday, Mr. Oldridge's girlfriend bought a condo (true story!) for $310,000 (number changed for privacy reasons).

a) Assuming that the condo increases in value by 8% each year, how much will it be worth in four years?

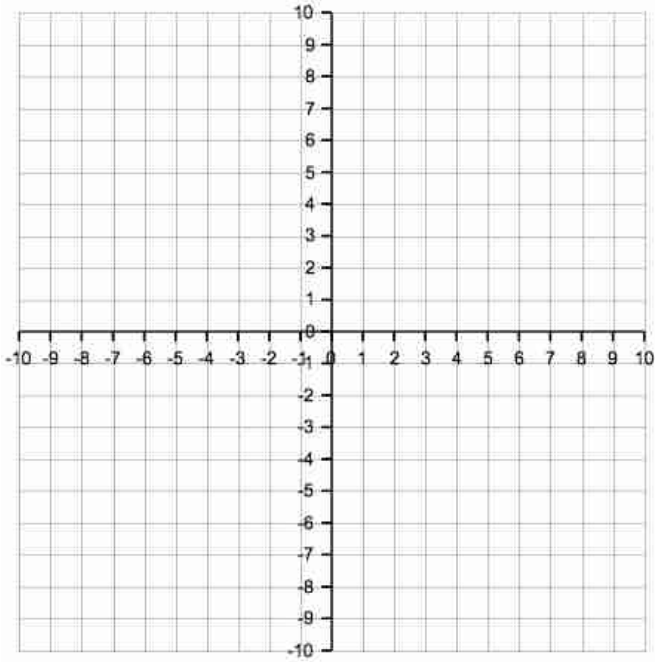
2 A

b) Assuming that the condo **decreases** in value by 4% each year, how much will it be worth in four years?

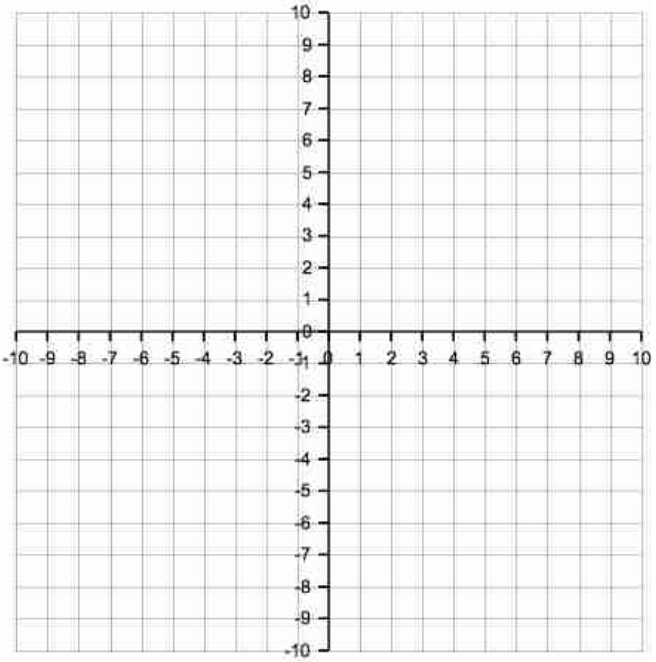
2 A

9. Graph each of the following functions.

$f(x)=-2(2)^{\frac{1}{3}(x-2)}+5$



$g(x)=\frac{1}{2}(3)^{(1-x)}$

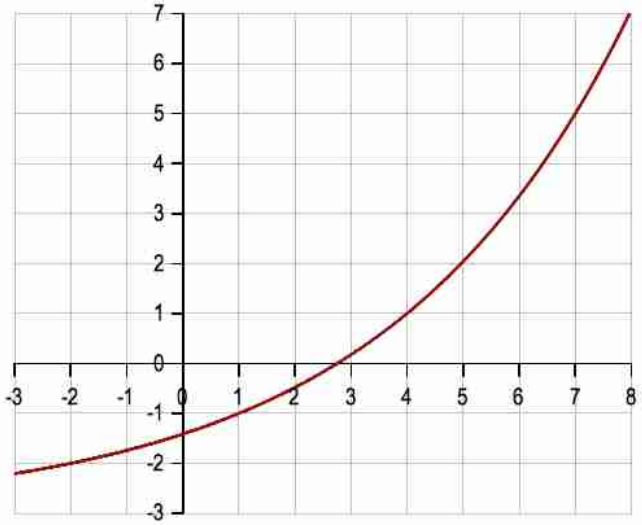


5 C

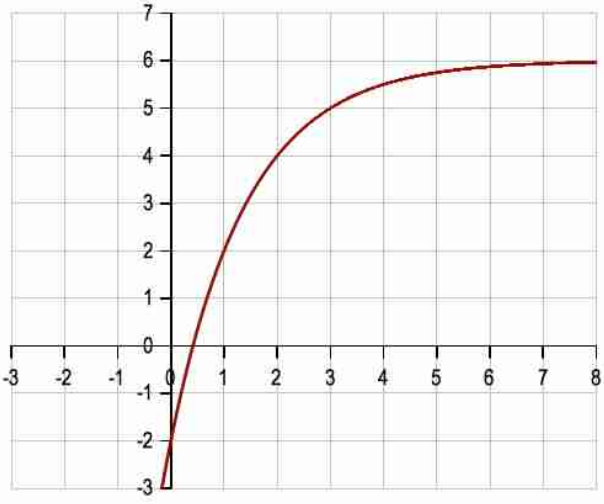
1 T

10. Give a valid equation for each of the following functions:

a)



b)



5 A

11. Write **two** equivalent exponential expressions for each of the following.

a) $h(x)=5(\frac{1}{5})^{\frac{x-5}{7}}-7$

b) $j(x)=-(16)^{2-x}+4$

4 T