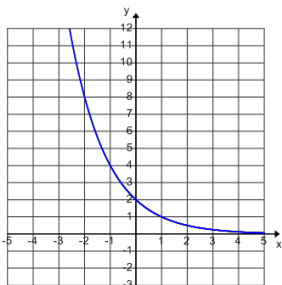## MCR3UI - Unit 5 Day 2

The Equation of Exponential Functions
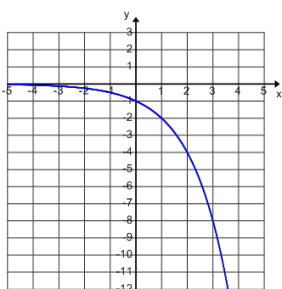
Practice Questions

1. Match each graph with its corresponding equation.
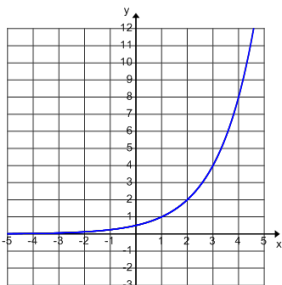
   (a)
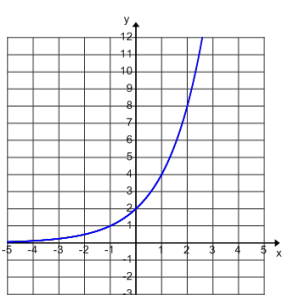

   (b)

   (c)


   (d)

   A $y = 2 \times 2^x$
   B $y = 2 \times \left(\frac{1}{2}\right)^x$
   C $y = \frac{1}{2} \times 2^x$
   D $y = -2^x$

2. (a) Sketch the graph of an exponential function that satisfies all of these conditions:

    (i) domain $\{x \in \mathbb{R}\}$

    (ii) range $\{y \in \mathbb{R}, y > 0\}$

    (iii) y-intercept 5

    (iv) function increasing

  (b) Is this the only possible graph? Explain.

3. (a) Sketch the graph of an exponential function that satisfies all of these conditions:

    (i) domain $\{x \in \mathbb{R}\}$

    (ii) range $\{y \in \mathbb{R}, y < 0\}$

    (iii) y-intercept -2

    (iv) function decreasing

  (b) Is this the only possible graph? Explain.

4. Write an exponential equation to match the graph shown.
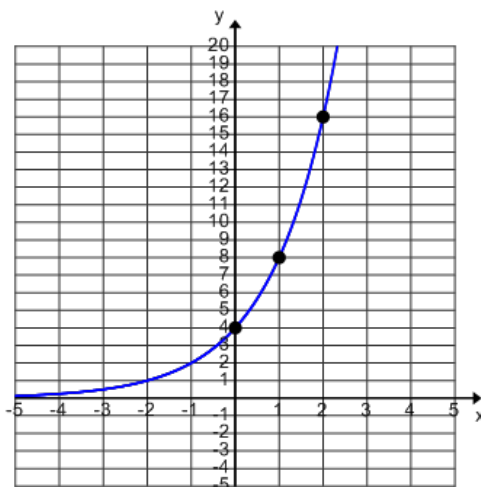
5. Write an exponential equation to match the graph shown.
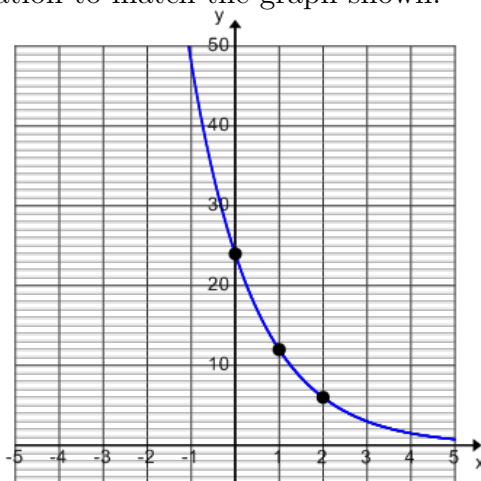
6. A radioactive sample with an initial mass of 25 mg has a half-life of 2 days.

   (a) Which equation models this exponential decay, where t is the time in days, and A is the amount of the substance that remains.

   A $A = 25 \times 2^{\frac{t}{2}}$

   B $A = 25 \times \left(\frac{1}{2}\right)^{2t}$

   C $A = 25 \times \left(\frac{1}{2}\right)^{\frac{t}{2}}$

   D $A = 2 \times 25^{\frac{1}{2}}$

   (b) What is the amount of radioactive material remaining after 7 days?

7. Graph each function and identify the:

   (i) domain

   (ii) range

   (iii) x- and y- intercepts

   (iv) intervals of increase/decrease

   (v) asymptote

   (a) $f(x) = \left(\frac{1}{2}\right)^{x}$
   (b) $y = 2 \times 1.5^{x}$
   (c) $y = -\left(\frac{1}{3}\right)^{x}$

   Extra Fun Practice!

7. Consider the function $y = 12\left(\frac{1}{2}\right)^{x} - 3$. The y-intercept is b and the x-intercept is a. The sum of a and b is:

   A 11   **B** 6   **C** 7   **D** 18

8. A number is between 20 and 30. When this number is subtracted from its cube, the result is 13 800. When the same number is added to its cube, the answer is:

   A 13 848   **B** 13 852   **C** 13 846   **D** 13 844