# Algebra 1　　　　Chapter 8 Review　　　　Spring 2014

1. State if each of the functions is an example of exponential growth or decay

a) $y = \frac{1}{4}(7)^x$　　b) $y = 15(\frac{2}{3})^x$　　c) $y = 95(1.13)^x$　　d) $f(x) = 12^x$　　e) $y = 3.5(\frac{5}{4})^{-x}$　　f) $f(x) = 8(0.95)^x$

Simplify each. Write the answer without zero or negative exponents.
Give fractional answers in reduced form, no decimals.

2. $4x^{-3}$　　　　3. $x^2 \bullet x \bullet x^4$　　　　4. $(10h^4j^5)(4h^2j^{-1})$　　　　5. $(75x^2y^3)^0$

6. $\frac{-3}{t^{-8}}$　　　　7. $\frac{6A}{3^{-1}C^{-3}}$　　　　8. $\frac{5^{-2}m^{-4}k^0r^3}{4c^5v^{-2}}$　　　　9. $\frac{m^8}{m^3}$

10. $\frac{6c^7d^5}{24c^{10}d^3}$　　　　11. $(R^5M^2)^3$　　　　12. $(3a^{-2}k^5)^4$　　　　13. $(2w^4x^{-3}y)^{-5}$

14. $(5ab^0c^3)^2(2a^{-5}b^4c^6)^3$　　　　15. $\left(\frac{6c^5e^4}{3c^2e^9}\right)^4$　　　　16. $\frac{n^{-3}k^4}{n^{-7}k^5w^{-6}}$

17. $(2S^{-3}T^5)^4(4ST^{-1})^{-2}$　　　　18. $\left(\frac{5R^{-2}V^6W^2}{3R^5V^4}\right)^{-2}$

Evaluate each expression for $X = -4$　　$Y = 6$　　$Z = -2$
Give fractional answers in reduced form. No decimals.

19. $X^{-3}YZ^2$　　　　20. $8Z^3Y^{-2}$　　　　21. $(10X^2Y^{-1})^2$

22. Write the growth/decay factor ($b$) that each % change represents.

a) 15% increase　　b) 60% decrease　　c) 150% increase　　d) 2.1% decrease

23. For each growth/decay factor in the exponential equations below give the % change it represents.

a) $y = 1500(1.03)^x$　　b) $f(x) = 27.8(3.15)^x$　　c) $y = 8(0.77)^x$　　d) $y = 100(0.995)^x$

24. The number of mosquitos doubles every 3 days in a certain area. Today there are 1500 mosquitos.
a) Model this situation with an exponential equation.
b) Find the number of mosquitos in 15 days.

25. The half-life of a certain pain medication is 4 hrs. A 15 mg dose is taken at 7:00 am.
a) Model this situation with an exponential equation.
b) Find the amount of medication remaining at 11:00 pm.

26. You put $20,000 in an investment that pays 6% interest.
a) Model this situation with an exponential equation.
b) Find the value of this investment when you retire from your job in 30 years.

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27. The population of a city was 97,500 in 1992.  The population has been decreasing 4% each year.
a)  Model this situation with an exponential equation.
b)  Find the population in 2005.


28.  The amount of trash being put into landfills has been increasing 1.5% each year since 1990 when there was 2,000,000 million pounds of trash placed into landfills.
a)  Model this situation with an exponential equation.
b)  Find the amount of trash placed into landfills in 2010.
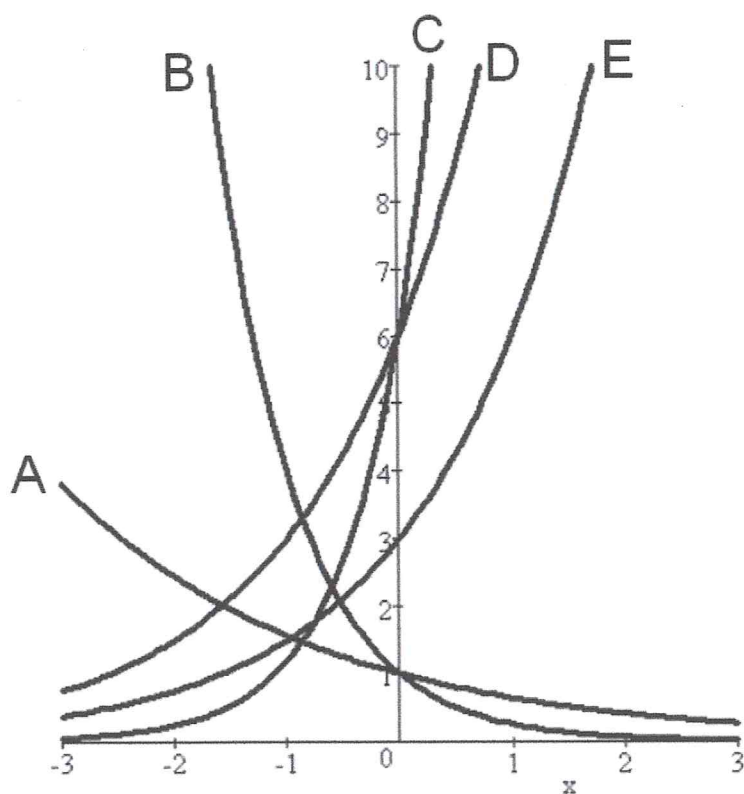
Match each equation to its graph.
29. $y = 6(2)^x$        30. $y = 3(2)^x$        31. $y = 6(5)^x$        32. $y = (0.25)^x$        33. $y = (0.64)^x$

Algebra 1    Chapter 8 Review    Spring 2014    ANSWERS

1. a) Growth    b) Decay    c) Growth    d) Growth    e) Decay    f) Decay

2. $\dfrac{4}{x^3}$    3. $x^7$    4. $40h^6j^4$    5. 1    6. $-3t^8$    7. $18AC^3$

8. $\dfrac{r^3v^2}{100c^5m^4}$    9. $m^5$    10. $\dfrac{d^2}{4c^3}$    11. $M^6R^{15}$    12. $\dfrac{81k^{20}}{a^8}$

13. $\dfrac{x^{15}}{32w^{20}y^5}$    14. $\dfrac{200b^{12}c^{24}}{a^{13}}$    15. $\dfrac{16c^{12}}{e^{20}}$    16. $\dfrac{n^4w^6}{k}$    17. $\dfrac{T^{22}}{S^{14}}$

18. $\dfrac{9R^{14}}{25V^4W^4}$    19. $-\dfrac{3}{8}$    20. $-\dfrac{16}{9}$    21. $\dfrac{6400}{9}$

22. a) $b = 1.15$    b) $b = 0.40$    c) $b = 2.50$    d) $b = 0.979$

23. a) 3% change    b) 215% change    c) 23% change    d) 0.5% change

24. a) $.y = 1500(2)^x$    b) $x = 5 \rightarrow y = 1500(2)^5 = 48,000$ mosquitos

25. a) $.y = 15(0.5)^x$    b) $x = 4 \rightarrow y = 15(0.5)^4 = 0.9375$ mg

26. a) $.y = 20,000(1.06)^x$    b) $y = 20,000(1.06)^{30} = \$114,869.82$

27. a) $y = 97,500(0.96)^x$    b) $x = 13 \rightarrow y = 97,500(0.96)^{13} = 57,350$ people

28. a) $y = 2,000,000(1.015)^x$    b) $x = 20 \rightarrow y = 2,000,000(1.015)^{20} = 2,693,710$ pounds

29. D    30. E    31. C    32. B    33. A