Final Review
Secondary Math 3

Name Answer Key

Quarter 3

CHAPTER 6- Sequences, Series and Exponentials

Find the stated term for the following sequences

1. −3, −6, −12, −24, ...; 9th term

a= $-3/2$

r= 2

9th term?= -768

$-\frac{3}{2}(2)^9 =$

2. 2, 7, 12, 17,.....

a= −3

d= 5

11th Term?= 52

$-3+5(11) =$

Find the sum of the geometric series.

3. 4 + 16 + 64 + 256 + ... + 16,384

$+1024 + 4096 + \ldots = 21844$

4. 3 − 6 + 12 − 24 + ... − 1536

$+48 - 96 + 192 - 384 + 768 \ldots = -1023$

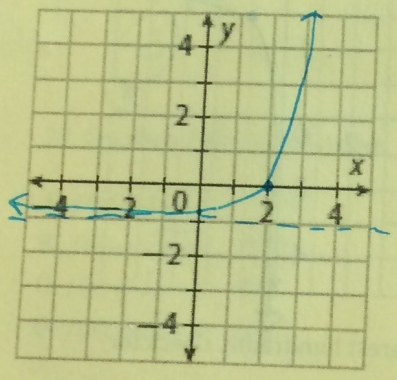
Find the domain, range, and transformations and graph each of the following functions

5. $f(x) = 3^{x-2} - 1$

D: $(-\infty, \infty)$

R: $(-1, \infty)$

y-int: $(0, -8/9)$ $3^{0-2} - 1 = 3^{-2} - 1$ $\frac{1}{9} - 1 = -\frac{8}{9}$

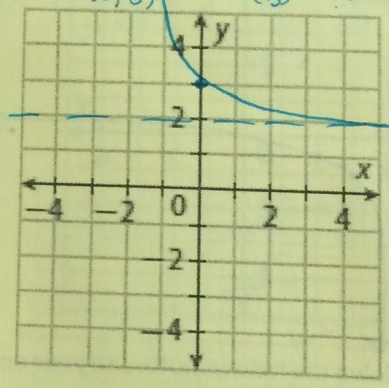


6. $f(x) = \left(\frac{1}{3}\right)^x + 2$

D: $(-\infty, \infty)$

R: $(2, \infty)$

y-int: $(0, 3)$ $(\frac{1}{3})^0 + 2 = 1 + 2 = 3$



7. You invest $3000 into an account at a 3.5% interest rate compounding continuously. When will you have $5000? $A(t) = Pe^{rt}$

$3000e^{.035t} = 5000$ graph!

$e^{.035t} = \frac{5000}{3000}$

$\ln e^{.035t} = \ln(5/3)$

$\frac{.035t}{.035} = \frac{\ln(5/3)}{.035}$

$t = 14.6$ yrs

$25000\left(1-\frac{.1}{4}\right)^{4(7)}=$

8. A car with a cost of $25,000 is decreasing in value at a rate of 10% compounding quarterly. How much money will you have after 7 years? $A(t)=P\left(1+\frac{r}{n}\right)^{nt}$

$12304.65

CHAPTER 7-Logs

Write the following in exponential or logarithmic form

9. $4^2=16$ → $\log_4 16=2$

10. $e^{17}=a$ → $\ln a=17$

11. $\log_7 x=10$ → $7^{10}=x$

12. $\ln x=32$ → $e^{32}=x$

Evaluate the following

13. $\log_{12} 12^{15}$ → 15

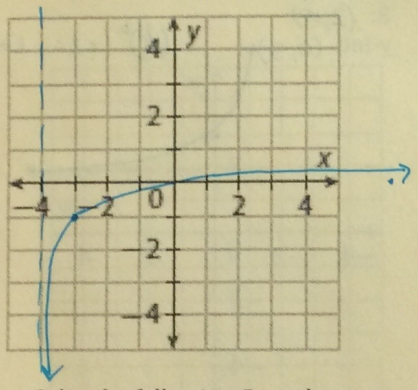
14. $\ln e^{32}$ → 32

15. $10^{\log 14}$ → 14

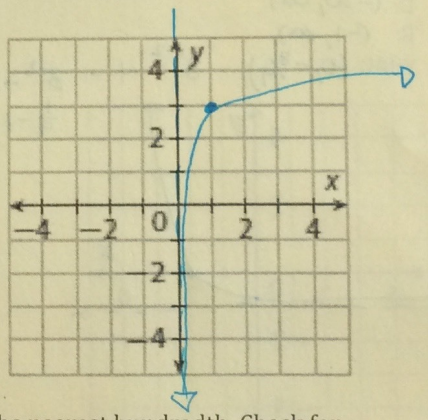
16. $\log_5 \sqrt{5}=\log_5 5^{\frac{1}{2}}$ → $\frac{1}{2}$

Graph the following logs:

17. $y=\log(x+4)-1$ ← 4 ↓ 1



18. $y=\log(x)+3$



Solve the following. Round your answer to the nearest hundredth. Check for extraneous solutions.

19. $4^{2x+10}+6=262$

$-6 \quad -6$

$\log_4 4^{2x+10}=\log_4 256$

$2x+10=4$

$-10 \quad -10$

$\frac{2x}{2}=\frac{-6}{2}$

$x=-3$

20. $7e^{\frac{x}{4}}=500$

$\frac{7}{7} \quad \frac{500}{7}$

$\ln e^{x/4}=\ln\left(\frac{500}{7}\right)$

$\frac{x}{4}\cdot 4=\ln\left(\frac{500}{7}\right)\cdot 4$

$x=17.07$

21. $\log_2 4x = 4$

$4x = 2^4$ $\quad x = \frac{16}{4}$

$x = 4$

22. $\ln(x+2) = \ln 30$

$x + 2 = 30$

$-2 \quad -2$

$x = 28$

Quarter 4 Review

CHAPTER 8 -Radicals

Simplify.

23. $\sqrt{512x^2}$ $\quad 16x\sqrt{2}$

24. $\sqrt[3]{-162}$ $\quad -3\sqrt[3]{6}$

Simplify.

25. $\sqrt[5]{-32x^6y^{10}z}$ $\quad -2xy^2\sqrt[5]{xz}$

26. $\sqrt[6]{448x^7y^8}$ $\quad 2xy\sqrt[6]{7xy^2}$

Evaluate without a calculator. Write in radical form, then simplify.

27. $9^{\frac{1}{2}}$ $\quad \sqrt{9}$ $\quad 3$

28. $32^{\frac{2}{5}}$ $\quad (\sqrt[5]{32})^2$ $\quad 2^2$ $\quad 4$

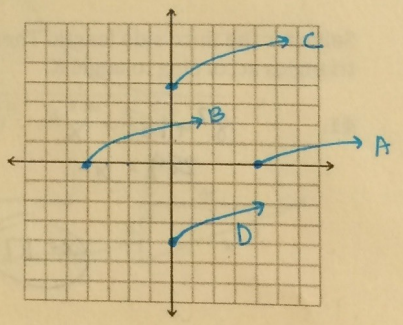
29. Graph each of the following:

A. $f(x) = \sqrt{x-4}$ $\quad \rightarrow 4$

B. $f(x) = \sqrt{x+4}$ $\quad \leftarrow 4$

C. $f(x) = \sqrt{x}+4$ $\quad \uparrow 4$

D. $f(x) = \sqrt{x}-4$ $\quad \downarrow 4$



Describe all transformations of the function *and* state the domain and range:

30. $y = 2\sqrt{x-4}+5$

- V. Stretch by 2
- Shift Right 4
- Shift up 5

D: $[4, \infty)$

R: $[5, \infty)$

31. $y = -\sqrt{x}+3$

V. Flip

Shift up 3

D: $(0, \infty)$

R: $(-\infty, 3]$

Solve the following radical equations.

32. $(x-6)^2 = \sqrt{7x-54}^2$

$(x-6)(x-6) = 7x-54$

$x^2-12x+36 = 7x-54$

$-7x+54 \quad -7x+54$

$x^2-19x+90 = 0$

$(x-10)(x-9) = 0$

$x = 10, 9$

33. $\left(\sqrt{3x+2}\right)^2 = \left(3\sqrt{x}\right)^2$

$3x+2 = 9x$

$-3x \quad -3x$

$\frac{2}{6} = \frac{6x}{6}$

$x = 1/3$

34. $\sqrt[3]{x-5}+5 = -1$

$-5 \quad -5$

$\sqrt[3]{x-5}^3 = -6^3$

$x-5 = -216$

$+5 \quad +5$

$x = -211$

CHAPTER 9-Trig

Fill in the blank with the correct ratio (opposite, hypotenuse, adjacent)

35. $\sin\theta =$ opp / hyp

36. $\cos\theta =$ adj / hyp

37. $\tan\theta =$ opp / adj

38. $\csc\theta =$ hyp / opp

39. $\sec\theta =$ hyp / adj

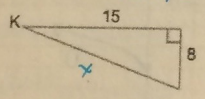
40. $\cot\theta =$ adj / opp

Solve for the third side length. Then write all six trig functions for the following triangles according to angle K.

41.

$8^2+15^2 = x^2$

$289 = x^2$

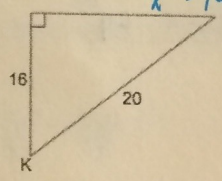


$x = 17$

42.

$16^2+x^2 = 20^2$

$x^2 = 144$

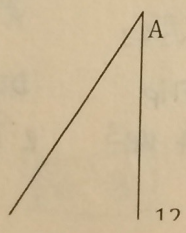


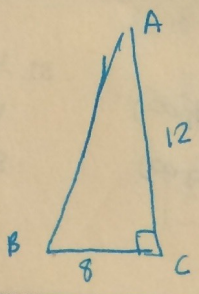
$x = 12$

43. Solve the following triangle

$8^2+12^2 = c^2$

$c = 14.4$





$\sin A =$

Answers on next page.

$\tan^{-1}\left(\frac{8}{12}\right) = A = 33.7$ → ∠A 34° a 8

$\tan^{-1}\left(\frac{12}{8}\right) = B = 56.3$ ∠B 56° b 12

∠C 90° c 14.4

CHAPTER 10-Stats

44. The salaries at a small business with 7 employees are as follows:
$255,000, $32,000, $30,000, $28,000, $24,000, $22,000, $22,000

Mean: $59,000 Median: $28,000 Mode: $22,000

A. Find the mean, median and mode of the salaries.

B. Explain which measure of center best represents a typical employee's salary.

Median is ~~bet~~ best because $255,000 is an outlier

45. Find the five number summary, identify the range, IQR, and any outliers.

4	7	9	31	34	2	35	37	24	34	31	50
11	33	36	2	8	13	52	57	60	69	78	83

{2, 10, 33.5, 51, 83}

Range: 83 − 2 = 81

IQR: 51 − 10 = 41

No outliers

46. Label each bar with the percent probability an event will occur there.