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Advanced Algebra 2 with Trig.

Semester 2 Final Review

CHAPTER 6:

Name _____

Date _____ Period _____

Find the inverse of each function.

1) $g(x) = \frac{1}{3}x + \frac{5}{3}$

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

Perform the indicated operation.

3) $g(x) = 4x - 3$
 $h(x) = -4x + 3$
Find $g(h(x))$

4) $f(n) = 2n - 5$
 $g(n) = n + 1$
Find $f(g(n))$

5) $g(n) = n^2 + 3 + n$
 $f(n) = 4n - 3$
Find $g(f(n)) + f(n)$

6) $h(i) = i - 5$
 $g(i) = i^2 - 1$
Find $h(g(i)) - g(i)$

Solve each equation. Remember to check for extraneous solutions.

7) $x - 1 = \sqrt{7x - 17}$

8) $\sqrt{2n - 9} = \sqrt{9 - n} - 1$

9) $\frac{1}{2n} + \frac{n+6}{4n} = \frac{1}{n}$

10) $\frac{1}{n^2} = \frac{1}{5n^2} - \frac{4}{5n}$

11) $1 = \frac{a-2}{a-1} - \frac{1}{a^2 - 6a + 5}$

12) $\frac{k^2 + 2k - 3}{k^2 - 4k} - \frac{k - 3}{k - 4} = \frac{1}{k}$

Identify the domain and range of each.

13) $y = \sqrt{x+5}$

14) $y = \sqrt[3]{x+4-5}$

15) $y = \log_4(x-3) + 4$

16) $y = \log_4(x-1) + 5$

CHAPTER 7:

State the domain and range of the following functions.

17) $y = \frac{1}{4} \cdot \left(\frac{1}{8}\right)^{x+2} - 2$

18) $y = \frac{1}{4} \cdot 2^{x-1} + 2$

Rewrite each equation in exponential form.

19) $\log_9 \frac{1}{81} = -2$

20) $\log_{15} 225 = 2$

Rewrite each equation in logarithmic form.

21) $8^2 = 64$

22) $12^{-2} = \frac{1}{144}$

Evaluate each expression.

23) $\log_4 64$

24) $\log_5 1$

Use a calculator to approximate each to the nearest thousandth.

25) $\log_7 62$

26) $\log_6 3$

Expand each logarithm.

27) $\log_6 (w^3 \sqrt{u})$

Condense each expression to a single logarithm.

29) $10 \log_7 11 + 2 \log_7 12$

Solve each equation.

31) $\log_4 (n+2) = \log_4 (2n-1)$

33) $\log_6 (x+24) + \log_6 x = 2$

35) Jennifer invests \$6,939 in a savings account with a fixed annual interest rate of 2% compounded 12 times per year. What will the account balance be after 9 years?

CHAPTER 8:

Identify the domain and range of each.

37) $f(x) = -\frac{1}{x-2} + 1$

Simplify each expression.

39) $\frac{10k}{k^2 - 14k + 40} \cdot \frac{10k - 40}{10k^2 + 70k}$

41) $\frac{k^2 - 14k + 40}{k^2 + 5k - 50} \cdot \frac{r^2 + 4r - 60}{r^2 + 4r - 60}$

43) $\frac{5}{6} + \frac{5x}{5x+3}$

44) $\frac{3k}{k-6} - \frac{2}{2k+4}$

45) $\frac{5n}{5n+3} + \frac{6n}{4n}$

46) $2 - \frac{3}{x^2 + x - 2}$

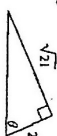
47) $\frac{u-1}{\frac{u}{4} + \frac{u-1}{u^2}}$

48) $\frac{m-5}{\frac{m-5}{9} + \frac{9}{m-5}}$

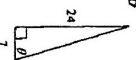
CHAPTER 13:

Find the value of the trig function indicated.

49) $\cos \theta$

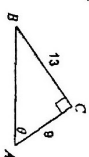


50) $\sec \theta$

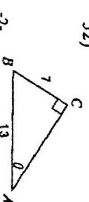


Find the measure of each angle indicated. Round to the nearest tenth.

51)



52)



Convert each degree measure into radians and each radian measure into degrees.

53) 495°

54) $-\frac{11\pi}{6}$

Find the exact value of each trigonometric function.

55) $\sin -45^\circ$

56) $\tan -\frac{11\pi}{6}$

57) $\csc 270^\circ$

58) $\sin \frac{5\pi}{4}$

59) $\tan \frac{5\pi}{3}$

60) $\tan 330^\circ$

61) $\tan -\pi$

62) $\cos -\frac{\pi}{6}$

Find the exact value of each expression in radians and degrees.

63) $\sin^{-1} 1$

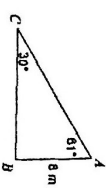
64) $\tan^{-1} \sqrt{3}$

65) $\sin^{-1} \frac{\sqrt{2}}{2}$

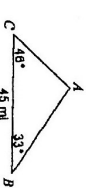
66) $\cos^{-1} \frac{\sqrt{3}}{2}$

Solve each triangle. Round your answers to the nearest tenth.

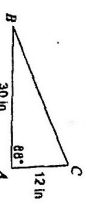
67)



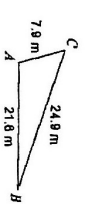
68)



69)



70)

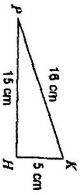


71) $m\angle A = 138^\circ$, $c = 22$ ft, $a = 43$ ft

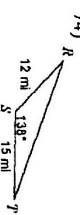
72) $m\angle A = 42^\circ$, $c = 25$ m, $a = 20$ m

Find the area of each triangle to the nearest tenth.

73)



74)



Using radians, find the amplitude and period of each function.

75) $y = 2\cos \frac{\theta}{3}$

76) $y = 2\cos 8\theta$

77) $y = \cos 2\theta$

78) $y = 4\cos \frac{\theta}{8}$

Answers to Semester 2 Final Review

1) $g^{-1}(x) = 3x - 5$

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

4) $2n - 3$

5) $x^2 + 5n$

6) $-t^2 + t - 4$

7) $\{6, 3\}$

8) $\{5\}$

9) $\{-4\}$

10) $\{-1\}$

11) $\{4\}$

12) $\left\{-\frac{1}{4}\right\}$

13) Domain: $x \geq -5$
Range: $y \geq 0$

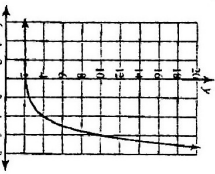
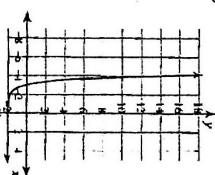
14) Domain: {All real numbers.}
Range: {All real numbers.}

15) Domain: $x > 3$
Range: All reals

16) Domain: $x > 1$
Range: All reals

17)

18)



19) $g^{-2} = \frac{1}{81}$

20) $15^2 = 225$

21) $\log_8 64 = 2$

22) $\log_{12} \frac{1}{144} = -2$

23) 3

24) 0

25) 2.121

26) 0.613

27) $5 \log_6 w + \frac{\log_6 u}{2}$

28) $3 \log_8 11 + 2 \log_8 12$

29) $\log_7 (12 \cdot 11^{10})$

30) $\log_6 \frac{a^5}{b^2}$

31) $\{3\}$

32) $\left\{-\frac{7}{3}\right\}$

33) $\{3\}$

34) $\left\{\frac{1}{3}, -\frac{1}{3}\right\}$

35) \$8,306.25

36) 20 years

37) Domain: All reals except 2
Range: All reals except 1

38) Domain: All reals except -1

39) $\frac{10}{(k-10)(k+7)}$

40) $\frac{2}{b-2}$

41) $\frac{r-5}{6(r-6)}$

42) $\frac{b-3}{3(b-9)}$

43) $\frac{55x+15}{6(5x+3)}$

44) $\frac{3k^2+5k+6}{(k-6)(k+2)}$

45) $\frac{25n+9}{2(5n+3)}$

46) $\frac{2x^2+2x-7}{(x-1)(x+2)}$

47) $\frac{4a^3-4a^2}{a^3+4a-4}$

48) $\frac{9m^2-90m+225}{m^2-10m+106}$

49) $\frac{2}{5}$

50) $\frac{25}{7}$

51) 55.3°

52) 32.6°

53) $\frac{11\pi}{4}$

54) -330°

55) $-\frac{\sqrt{2}}{2}$

56) $\frac{\sqrt{3}}{3}$

57) -1

58) $-\frac{\sqrt{2}}{2}$

59) $-\sqrt{3}$

60) $-\frac{\sqrt{3}}{3}$

61) 0

62) $\frac{\sqrt{3}}{2}$

63) $\frac{\pi}{2}$

64) $\frac{\pi}{3}$

65) $-\frac{\pi}{4}$

66) $\frac{5\pi}{6}$

67) $m\angle B = 89^\circ$, $a = 14$ m, $b = 16$ m

68) $m\angle A = 101^\circ$, $c = 33$ mi, $b = 25$ mi

69) $m\angle B = 22^\circ$, $m\angle C = 70^\circ$, $a = 31.9$ in

70) $m\angle B = 17.8^\circ$, $m\angle C = 56.7^\circ$, $m\angle A = 105.5^\circ$

71) $m\angle B = 22^\circ$, $m\angle C = 20^\circ$, $b = 24.1$ ft

72) $m\angle B = 81.2^\circ$, $m\angle C = 56.8^\circ$, $b = 29.5$ m OR $m\angle B = 14.8^\circ$, $m\angle C = 123.2^\circ$, $b = 7.6$ m

73) 37.5 cm²

74) 60.2 mi²

75) Amplitude: 2

76) Amplitude: 1

77) Amplitude: 4

78) Amplitude: 16

79) Period: $\frac{\pi}{4}$

80) Period: π

81) Period: π

82) Period: 16π