Pre-AP Precal

Spring Exam Review

Name _____ Date _____

Graph.

1. $y = -x(x+3)^2$

2. $y = (2x-1)^2(x+5)^2$

3. $y = (x+5)^3(x-2)^2$

4. $y = (x+2)(x-3)(x-5)^2$

State all horizontal and vertical asymptotes of the function.

5. $f(x) = \dfrac{2}{x+5}$

6. $p(x) = \dfrac{-1}{(x+4)^2}$

7. $f(x) = \dfrac{x}{(x+5)(x-1)}$

8. $p(x) = \dfrac{x+6}{x^2-9}$

9. $k(x) = \dfrac{2x+7}{x^2+1}$

10. $h(x) = \dfrac{x^2-1}{x^2-x-12}$

11. $f(x) = \dfrac{2x^2+5x-12}{x^2+2x-8}$

12. $g(x) = \dfrac{5x^2+29x-6}{x^2+5x-6}$

13. $f(x) = \dfrac{2x^3 + 5x^2 - 22x + 15}{x + 5}$

14. Write the first 5 terms of the sequence whose nth term is given by $a_n = n^2 - 3$.

15. In a given sequence, $a_1 = 3$; for $n > 1$, $a_n = a_{n-1} + 5$. Find a_2, a_3, a_4.

16. Give a formula for the nth term of the sequence $\frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \ldots$.

17. Find the sum: $\sum_{x=5}^{9} |4 - x|$

18. Find the sum: $\sum_{c=-2}^{3} (-2)^c$

19. Rewrite using sigma notation: $4-8+12-16+20$

20. Express using sigma notation: $12+3-6-15-24$

21. Complete the arithmetic sequence:
8, ____, 14, ____, ____.

22. Complete the geometric sequence:
81, 54, ____, ____, ____.

23. State the next 2 terms of the geometric sequence $64, -48, 36, \ldots$.

Determine whether the sequence is arithmetic, geometric, or neither.

24. 5, 7, 9, 11, 13

25. 3, 9, 27, 81

26. 7, 49, 343

27. $15,\ 17,\ 20,\ 22,\ 24$

Given $\triangle ABC$ with sides a, b, and c, and opposite angles α, β, and γ, solve the triangle.

28. $b = 45,\ \alpha = 56^\circ,\ \beta = 72^\circ$

29. $b = 82,\ \alpha = 47^\circ,\ \beta = 81^\circ$

Find the remainder when the polynomial is divided by the binomial (use the remainder theorem).

30. $x^2 - 2x - 63;\ \ x + 7$

31. $2x^4 + x^3 - x + 2;\ \ x - 2$

Given $\triangle ABC$ with sides a, b, and c, and opposite angles α, β, and γ, solve the triangle.

32. $a = 20,\ b = 43,\ \gamma = 89^\circ$

33. $a = 5,\ b = 6,\ c = 8$

34. The angle at one corner of a triangular plot of ground has measure 73°, and the sides that meet at this corner have lengths 175 feet and 150 feet. Find the length of the third side and find the area of the triangular piece of ground.

35. A triangular parking lot has sides of lengths 420 feet, 350 feet, and 180 feet. Find the smallest of the three angles of the parking lot.

Write as a single logarithm.

36. $\log 25 + \log 4$

37. $\log 400 - \log 4$

38. $6(\log a + \log b)$

39. $4\log w + 4\log u + 5\log v$

40. $10\log r + 2\log s + 5\log t$

41. $\log_a 2x + 3(\log_a x - \log_a y)$

Solve.

42. $5^x = 125$

43. $2^{-x} = 128$

44. $3^n = 8$

45. $6 = 2^n$

46. $7^{\log_7(20-x)} = 14$

47. $\log_5 125 = x$

48. $\log_4(3x - 2) = 2$

49. $3^{2x} - 8 \cdot 3^x + 15 = 0$

50. $2 = \log_3(9n + 10) - \log_3(5n)$

51. $\ln 5 + \ln(x + 2) = \ln 7$

52. Find the domain of $f(x) = \dfrac{1}{\sqrt{3-2x}}$.

a) $\left(-\infty, \frac{3}{2}\right)$ b) $\left[\frac{3}{2}, \infty\right)$

c) $\left(\frac{3}{2}, \infty\right)$ d) $\left(-\infty, \frac{3}{2}\right) \cup \left(\frac{3}{2}, \infty\right)$

e) $\left[0, \frac{3}{2}\right)$

53. What is the domain of $f(x) = \dfrac{2}{x^2 - 4x + 3}$?

a) $x \neq 2$ b) $x \neq 3$

c) $x \geq 3$ d) $x \neq 1$ and $x \neq 3$

e) $x \neq 3$ and $x \neq 2$

54. What is the domain of $f(x) = \dfrac{2}{x^2 - 5x + 6}$?

a) $x \neq 1$ and $x \neq -6$ b) $x \neq 2$ and $x \neq 3$

c) $x \neq 2$ d) $x \neq 5$

e) $x \geq 3$

55. Find the domain of the function $f(x) = \ln(3x + 1)$.

a) $(-\infty, \infty)$ b) $(-\frac{1}{3}, \infty)$ c) $(0, \infty)$

d) $(\frac{1}{3}, \infty)$ e) $(-\frac{1}{3}, \frac{1}{3})$

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1.
CodePath: TRI.IB.34

2.
CodePath: TRI.IB.57

3.
CodePath: TRI.IB.87

4.
CodePath: TRI.IB.74

5.
Answer: $x = -5,\ y = 0$
CodePath: TRI.ID.1

6.
Answer: $x = -4,\ y = 0$
CodePath: TRI.ID.23

7.
Answer: $x = -5,\ x = 1,\ y = 0$
CodePath: TRI.ID.27

8.
Answer: $x = \pm 3,\ y = 0$
CodePath: TRI.ID.29

9.
Answer: $y = 0$
CodePath: TRI.ID.61

10.
Answer: $x = -3,\ x = 4,\ y = 1$
CodePath: TRI.ID.70

11.
Answer: $x = 2,\ y = 2$
CodePath: TRI.ID.77

12.
Answer: $x = 1,\ y = 5$
CodePath: TRI.ID.78

13.
Answer: none
CodePath: TRI.ID.97

14.
Answer: $-2,\ 1,\ 6,\ 13,\ 22$
CodePath: TRI.LM.1

15.
Answer: 8, 13, 18
CodePath: TRI.LM.5

16.
Answer: $a_n = \frac{n+1}{n+2}$
CodePath: TRI.LM.9

17.
Answer: 15
CodePath: TRI.LM.11

18.
Answer: $-5\frac{1}{4}$
CodePath: TRI.LM.13

19.
Answer: $\sum_{k=1}^{5}(-1)^{k+1}(4k)$
CodePath: TRI.LM.17

20.
Answer: $\sum_{n=1}^{5}(21 - 9n)$
CodePath: TRI.LM.19

21.
Answer: 11, 17, 20
CodePath: TRI.LM.27

22.
Answer: 36, 24, 16
CodePath: TRI.LM.55

23.
Answer: $-27,\ 20.25$
CodePath: TRI.LM.61

24.
Answer: arithmetic $d = 2$
CodePath: TRI.LE.1

25.
Answer: geometric $r = 3$
CodePath: TRI.LE.5

26.
Answer: geometric $r = 7$
CodePath: TRI.LE.7

27.
Answer: neither
CodePath: TRI.LE.17

28.
Answer: $\gamma = 52^\circ,\ c = 37.3,\ a = 39.2$
CodePath: TRI.QF.1

29.
Answer: $\gamma = 52^\circ,\ a = 60.7,\ b = 65.4$
CodePath: TRI.QF.3

30.
Answer: 0
CodePath: TRI.GB.19

31.
Answer: 40
CodePath: TRI.GB.78

32.
Answer: $c = 47.1,\ \alpha = 25.1^\circ,\ \beta = 65.9^\circ$
CodePath: TRI.QG.1

33.
Answer: $\alpha = 38.6^\circ,\ \beta = 48.5^\circ,\ \gamma = 92.9^\circ$
CodePath: TRI.QG.17

34.
Answer: $194.36\,\text{ft},\ 12251\,\text{ft}^2$
CodePath: TRI.QK.25

35.
Answer: 24.98°
CodePath: TRI.QK.35

36.
Answer: $\log 100 = 2$
CodePath: TRI.KD.1

37.
Answer: $\log 100 = 2$
CodePath: TRI.KD.5

38.
Answer: $\log (ab)^6$
CodePath: TRI.KD.33

39.
Answer: $\log w^4u^4v^5$
CodePath: TRI.KD.49

40.
Answer: $\log r^{10}s^2t^5$
CodePath: TRI.KD.51

41.
Answer: $\log_a \frac{2x^4}{y^3}$
CodePath: TRI.KD.103

42.
Answer: $x = 3$
CodePath: TRI.KF.1

43.
Answer: $x = -7$
CodePath: TRI.KF.9

44.
Answer: $n = \frac{3\ln 2}{\ln 3} \approx 1.89$
CodePath: TRI.KF.47

45.
Answer: $n = \frac{\ln 6}{\ln 2} \approx 2.58$
CodePath: TRI.KF.48

46.
Answer: $x = 6$
CodePath: TRI.KF.85

47.
Answer: $x = 3$
CodePath: TRI.KF.105

48.
Answer: $x = 6$
CodePath: TRI.KF.129

49.
Answer: $x = 1$
CodePath: TRI.KF.69

50.
Answer: $n = \frac{5}{18}$
CodePath: TRI.KF.139

51.
Answer: $x = -\frac{3}{5}$
CodePath: TRI.KF.183

52.
Answer: a
CodePath: APC.BA.21

53.
Answer: d
CodePath: APC.BA.7

54.
Answer: b
CodePath: APC.BA.8

55.
Answer: b
CodePath: APC.BA.25