

Precalculus Final Exam Review Packet Answers

1. $y = -\frac{2}{3}x + \frac{4}{3}$

2. $y - 10 = \frac{1}{3}(x - 3)$

3. a. D: $[7, \infty)$, R: $[0, \infty)$
 b. D: $(-\infty, \infty)$ R: $[-4, \infty)$
 c. D: $(-\infty, 2) \cup (2, \infty)$
 R: $(-\infty, 0) \cup (0, \infty)$

4. a. decreasing on $(-\infty, \infty)$
 increasing on $(0, \infty)$
 b. increasing on $(-\infty, 1) \cup (1, \infty)$
 c. constant on $(-\infty, 3)$
 increasing on $[3, \infty)$

5. a. shift right 1, narrower
 b. shift left 1, down 8
 c. shift right 1, inverted, narrower

6. $f^{-1}(x) = \sqrt{-x-3} - 1$

7. $f(g(x)) = 80x^2 - 280x + 246$

8. $x = -3, 1, 2$

9. $(x+2)(x-1-i\sqrt{2})(x-1+i\sqrt{2})$

10. $x = \pm 3i, 5, 1$

11. $f(x) = x^4 - 7x^3 + 7x^2 + 25x - 50$

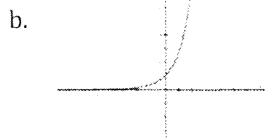
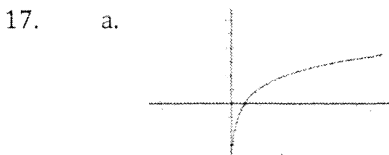
12. a. $x = \pm 2, y = 0$
 b. $x = -4, y = 1$
 c. $x = 3, y = 1$
 d. $x = 2, x = -5$
 e. $x = 2, x = -1, y = 5$

13. $y = \frac{1}{2}x + \frac{5}{4}$

14. a. $x = 4$
 b. $x = 2$
 c. $x = 1.209$

15. $3^4 = 81$

16. $\log_5 125 = 3$



18. a. $\log \frac{10}{3}$

b. $\log \left(\frac{x}{\sqrt{y}} \right)$

c. $\log \left[\frac{(x+1)^3(x-1)^2}{7} \right]^{1/5}$

19. a. $\log x - \frac{1}{2} \log y - \frac{1}{2} \log z$

b. $\ln 5 + \ln x - \frac{1}{3} \ln(x^2 + 1)$

20. a. $x = 567$, b. $x = 2$, c. $x = .599$

d. $x = 8/3$, e. $x = 7/3$

21. $\sin \theta = 12/13$ $\cos \theta = -5/13$

22. a. 270° , b. -240° , c. 30° , d. 75°

23. a. $3\pi/4$, b. $-4\pi/3$, c. $\pi/4$, d. 4π

24. a. $1/2$, b. 0, c. $\frac{2x}{\sqrt{4x^2+1}}$

25. a. -a, b. b, c. -a/b, d. a/b

26. a. period = π , amp. = 1, v.s. = 5 up, p.s. = 0

b. period = 2, amp = undefined, v.s. = 3 down, p.s. = 0

c. period = 8π , amp. = 4, v.s. = 0, p.s. = 4π

27. a. $\sin^2 x$ b. 1 c. $\sin x - 1$ d. $\sin^2 x$

28. 6.343 feet

29. 1072.550 feet

30. a. $x = \frac{\pi}{6}, \frac{5\pi}{6}$ b. $x = \pi$ c. $x = \pi/2$

d. $x = 2\pi/3$ e. \emptyset f. $x = \pi/4, 5\pi/4$

g. 0, π

31. $7/25$

32. $-\sqrt{3}/2$

33. Vertex: $\left(-\frac{1}{16}, -\frac{1}{2} \right)$

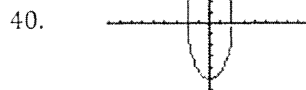
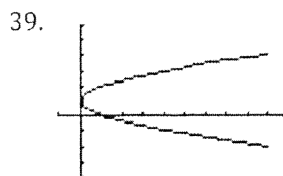
34. $y = -\frac{6}{49}(x+3)^2 + 1$

35. center: (2, 3)

36. hyperbola

37. vertices: $(0, \pm 2\sqrt{3})$

38. a. hyperbola, b. circle, c. parabola



41. Answers will vary

42. $T = 3.995 \text{ sec}$

$X = 359.986 \text{ ft}$

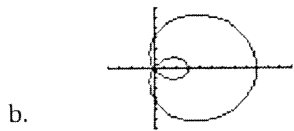
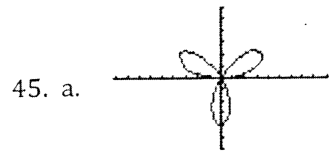
43. a. $\left(\frac{5\sqrt{3}}{2}, \frac{-5}{2}\right)$ b. $y = \frac{1}{\sqrt{3}}x$

c. $x^2 + y^2 - 6y = 0$

44. a. $(5, 53.130^\circ)$ or $(5, 0.927 \text{ rad})$

b. $r = 6 \cos \theta$

c. $r = \frac{-5}{-2 \cos \theta + 3 \sin \theta}$



46. 2 47. ∞ 48. DNE

49. 100 50. $1/6$ 51. 0

52. 7 53. DNE 54. 1

55. $1/4$ 56. 5 57. $3/2$

58. ∞ 59. 5

60. removable discontinuity at $x = -2$

61. a. -9, b. $-5/2$, c. -14