ALGEBRA II SPRING FINAL
(Review Problems)

1. Simplify $\sqrt[4]{32x^{19}y^{8}}$

2. Simplify $\dfrac{3}{\sqrt{2}}$

3. Simplify $\sqrt[3]{3x^{2}} \cdot \sqrt[3]{x^{2}} \cdot \sqrt[3]{9x^{3}}$

4. Simplify $\dfrac{\sqrt[3]{5}}{\sqrt[3]{6}}$

5. Simplify $5\sqrt{2xy^{6}} \cdot 2\sqrt{2x^{3}y}$

6. Simplify $\sqrt{75}+2\sqrt{48}-5\sqrt{3}$

7. Simplify $(2-\sqrt{98})(3+\sqrt{18})$

8. Simplify $\dfrac{4+\sqrt{6}}{\sqrt{2}+\sqrt{3}}$

9. Simplify $(-216)^{-\frac{2}{3}}$

10. Solve $\sqrt{x+20}-x=0$

11. Solve $(2x+3)^{\frac{3}{4}}-3=5$

12. Evaluate $\log_5 125$

13. Simplify $2\log 5 + \log 4$

14. Simplify $\log_4 16$

15. Solve $9^{2x} = 42$

16. Solve $\log_3 9x = 2$

17. Solve $5e^{6x+3} = 0.1$

18. Solve $\ln 3x = 6$

19. An investment company promises to invest your $400.00 at a rate of 7.6% compounded continuously for 1.5 years. How much money will you have at the end of this time? (Use $A = Pe^{rt}$)

20. Find the inverse of $f(x) = 3x + 1$

21. Let $f(x) = x^3$ and $g(x) = x - 3$. Find $f(g(-2))$.

22. If $f(x) = 10x - 10$ find $(f^{-1} \circ f)(8)$

23. Draw a graph representing exponential decay

24. Write the direct variation equation given that $x = 4$ when $y = 8$.

25. d varies jointly with r and t. If $d = 110$ when $r = 55$ and $t = 2$, find r when $d = 40$ and $t = 3$.

26. Simplify $\dfrac{x^2 - 5x + 6}{x^2 - 4} \cdot \dfrac{x^2 + 3x + 2}{x^2 - 2x - 3}$

27. Simplify $\frac{x^2-6x+8}{x^2-5x+6} \div \frac{x^2-7x+12}{x^2-4x+4}$

28. Simplify $\frac{3x}{x^2-9} - \frac{4}{2x-6}$

29. Simplify $\frac{3}{x+1} + \frac{x}{x-1}$

30. Solve $\frac{5x}{x-5} + \frac{4}{x+6} = \frac{54x+5}{x^2+x-30}$

31. The graph of $y = \frac{2}{x}$ is to be translated three units to the left and four units upward. What is the new equation?

32. State the vertical asymptotes for $y = \frac{(x+3)(2x-5)}{(x-4)(2x+3)}$

33. State the restrictions for $\frac{x}{x^2-4} + \frac{3}{x+5} = \frac{6}{5x}$

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

35. Given an arithmetic sequence where $a_1 = 4$ and $d = 3$, find a_{25}

36. In an arithmetic sequence, $a_n = 68$, $a_1 = 5$ and $d = 3$. Find n.

37. Given a geometric sequence where $a_1 = 1$ and $r = 2$, find a_{10}.

38. In a geometric sequence, $a_4 = 7$ and $a_7 = 56$. Find a_6.

39. State the upper limit of the summation $\sum_{n=1}^{50}(n+6)$

40. Evaluate the arithmetic series defined by $\sum_{n=1}^{60}1+3(n-1)$

41. Evaluate the geometric series defined by $\sum_{n=1}^{5}3(2)^{n-1}$

42. Find the mean and median of the following set of values:
{8, 9, 11, 12, 13, 15, 16, 18, 20}

43. Use the IQR rule to identify any outliers: {17, 15, 16, 15, 9, 18, 16, 13}

44. A set of data is normally distributed with mean of 100 and standard deviation of 10. What percent of the data is between 90 and 120?

45. A set of test scores has mean 30 and standard deviation of 3. Find the *z*-score of a test score of 37.

POTENTIAL ANSWERS

1. $2x^4y^2\sqrt[4]{2y^3}$

2. $\frac{3\sqrt{2}}{2}$

3. $3x^2\sqrt[3]{x}$

4. $\frac{\sqrt[3]{180}}{6}$

5. $20x^2y^3\sqrt{y}$

6. $8\sqrt{3}$

7. $-36-15\sqrt{2}$

8. $2\sqrt{3}-\sqrt{2}$

9. $\frac{1}{36}$

10. $x = 5, -4$ (– 4 extraneous)

11. 2

12. 3

13. 2

14. 2

15. .8505

16. 1

17. $x = -1.1520$

18. 134.4763

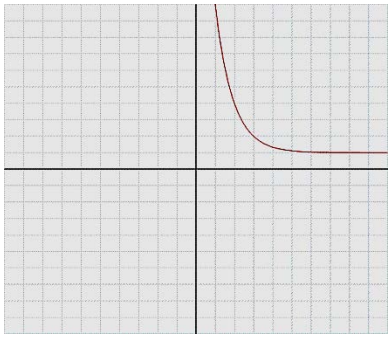
19. $448.30

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

21. –125

22. 8

23. Answers may vary



24. $y = 2x$

25. $r = \frac{40}{3}$

26. 1

27. $\frac{x^2 - 4x + 4}{x^2 - 6x + 9}$

28. $\frac{x - 6}{x^2 - 9}$

29. $\frac{x^2 + 4x - 3}{x^2 - 1}$

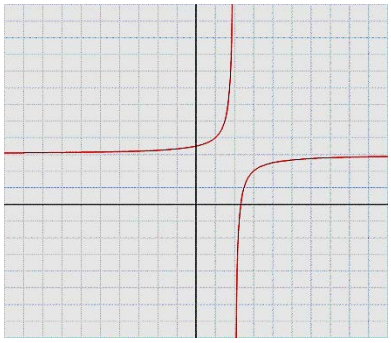
30. $x = -1$

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

32. $x = 4$ and $x = -\frac{3}{2}$

33. $x \neq -5, -2, 0, 2$

34.



35. 76

36. 22

37. 512

38. 28

39. 50

40. 5370

41. 93

42. $\bar{x}$ = 13.56, M = 13

43. IQR = $Q_3 - Q_1$ = 16.5 – 14 = 2.5

Low outlier < 10.25 = **9**

High outlier > 20.25 = none

44. 81.5%

45. 2.33