1. Factor: $121n^2 + 100$

2. Factor: $8x^2yz^3 - 4xy^5z + 20x^3y^2z$

3. Identify the interval on which $3x^2 - 6x - 24 > 0$

4. Solve: $-3(x+2)^2 - 6 = -18$

5. Solve the quadratic: $2x^2 - 3x = -2$

6. Over what interval is the graph decreasing?
   $-x^2 + 2x + 48 = 0$

7. Solve $x^3 - 5x = 0$ and classify the solutions.

8. If $f(x) = -3(x+2)^2$ and $g(x) = x^2 - 2x - 3$, then find $-3f(2) - 2g(-1)$.

9. Classify by degree and number of terms:
   $14x^3 - x^5 + 3x^2$

10. $(x^3 - 2x + 1) \div (x - 3)$ has a remainder of?

11. Use Pascal's triangle to expand: $(3x-2)^4$

12. Factor $(2x^3+16)$ completely:

13. If a quartic polynomial has the following roots: $7i,\ and\ -3+\sqrt{7}$, then what are the other roots?

14. Find all the zeros of the polynomial function: $3x^4-6x^3+9x^2-18x$

15. What will a graph do if there is an even amount of the same solutions? An odd amount of the same solutions?

16. If $f(-2)=0$, then what is a factor that we know? An x – intercept that we know?

17. Simplify: $\dfrac{2x^2+13x+20}{2x^2+17x+30}$

18. Simplify: $\dfrac{-3}{x-2}+\dfrac{17}{2x^2-4x}$

19. Simplify: $\dfrac{x^2+2x-15}{2x^2-8x-90}\div\dfrac{x^2-25}{2x^3}$

20. Solve: $x+2=\sqrt{2x+12}$

21. Solve $3(x-5)^{\frac{1}{3}} = -9$

22. Find the coordinates of the hole from:
$$f(x) = \frac{x^2 + x - 6}{x^2 - 4}$$

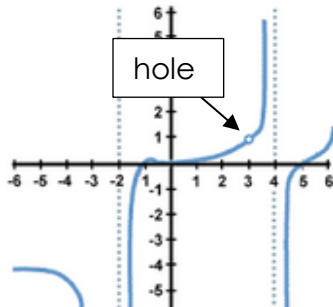23. Find the x – intercept and y – intercept from:
$$\frac{x^2 - x - 6}{x + 6}$$

24. Determine the horizontal and vertical asymptotes for: $f(x) = \frac{-4x + 9}{x^2 - 4}$

25. Find the domain and the range of the function

hole

26. State the domain and range of:
$$f(x) = \frac{2}{3}\sqrt{2x - 5} - 7$$

27. Describe the transformations of:
$$f(x) = \frac{1}{2}\sqrt[3]{-3(x+4)}$$

28. Condense: $3\log x + \log 4 - \log x - \frac{1}{2}\log 6$

29. Determine the range of: $f(x) = -\left(\frac{2}{3}\right)^x - 3$

30. If you deposited \$2500 into an account that is compounded continuously at 3.8%. How long would it take for it to reach \$5400?

31. Solve: $\log_2(x+2) + \log_2 3 = \log_2 27$

32. Find the inverse of $f(x) = -\ln(x-1) + 3$

33. You deposited \$1628 at a rate of 4% in a savings account compounded monthly. Find the balance after 15 years.

34. Write the equation of the natural logarithm that has a domain of $(-\infty, -3)$, and is reflected over the y – axis.

35. $f(x) = 5x^3$; $g(x) = -2x + 7$; $h(x) = 4x^2 - 3x$

Find $h(g(x))$

36. A travel agent can arrange for at most 36 people to go on a trip. The trip needs at least 10 men and 12 women committed. The agent will make \$22 profit per man and \$18 profit per woman. Find the constraints and objective function.
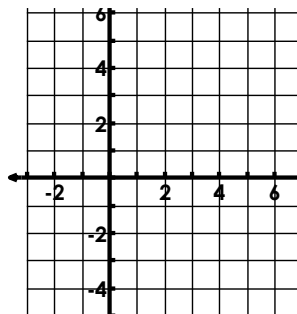
37. Graph

$f(x) = \frac{1}{2}|x + 3| - 1$
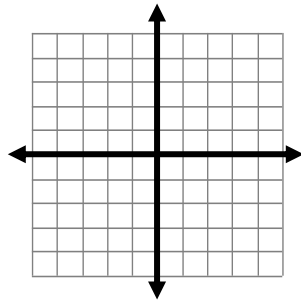
38. Find the sum of the first 12 terms of the geometric sequence if $a_1 = 10$ and $r = \frac{1}{2}$.

39. Graph:

$f(x) = \begin{cases} (x - 4)^2, & x < 4 \\ -x + 1, & x \geq 4 \end{cases}$

40. A normal distribution of ACT scores has a mean score of 18 and a standard deviation of 6. Find the probability that you scored higher than a 25

41. Suppose test scores on an exam show a normal distribution with a mean of an 80 and a standard deviation of 4. Within what range do about 68% of the scores fall?

42. List the 6 types of sampling methods and be able to give an example of each.