NAME: _____ DATE: _____

# PRE-CAL PAP SUMMER 2017 REVIEW
## ***DUE AUGUST 28***

You can see this site for help: https://www.khanacademy.org/math/algebra2

1. Simplify the following radical expression. Provide answers in simplest radical form.
$-5\sqrt{240}$ =

2. Simplify the following rational expression: $\frac{2\sqrt{5}}{-\sqrt{75}} =$

3. Simplify the following expression: $\left(\frac{4a^{-3}b^2}{5a^4b^3}\right)^2$

4. Simplify the following expression: $\left(2a^{-2}b^4\right)^{-3}$

5. Solve the following equation: 3 (4 - 2x) = -5x – 3 (x-1)

6. Solve the following equation: $\frac{x-2}{\frac{1}{4}} = \frac{2}{7}$

7. Solve the following inequality: $\frac{2x-8}{3} \geq 2x-20$

8. On your basketball team, the starting players' scoring averages are between 10 and 24 points per game. What absolute value inequality describes the scoring averages for the players?

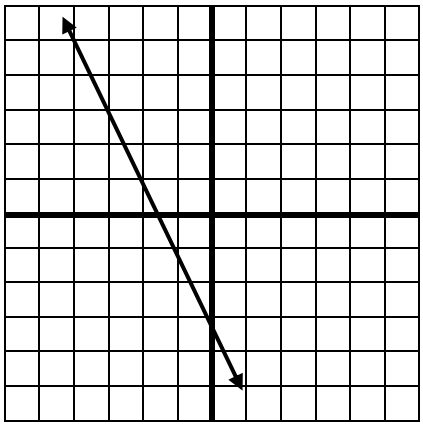
A. $|x-10| < 24$
B. $|x-24| < 10$
C. $|x-17| < 7$
D. $|x-17| \leq 7$

9. Is this a linear function?

| X | -6 | -1 | 4 | 9 | 14 | 16 |
|---|---|---|---|---|---|---|
| y | 1 | 3 | 5 | 7 | 9 | 11 |

A. Yes, because there is a constant additive change in the x values.
B. Yes, because there is a constant additive change in the x and y values.
C. No, because there is not a constant additive change in the x values.
D. No, because there is not a constant additive change in the y values.

10. What is the equation of the line?



11. Write the equation of the line that passes through the point (2,3) and is parallel to the line x-2y=6 in slope intercept form.

Determine whether the following statements are always true, sometimes true, or never true.

12. A line that has a slope of zero is perpendicular to the y-axis.
A. Always
B. Sometimes
C. Never

13. A line with a negative slope and a positive y-intercept will pass through quadrant III.
A. Always
B. Sometimes
C. Never

14. A line that passes through (0,0) and (2,4) will have the slope of 4.
A. Always
B. Sometimes
C. Never

15. Solve for x: $\left|2(x-4)\right| \le 8$

16. Identify the domain for the following function. $f(x) = \dfrac{x^2 - 7}{2x + 3}$

17. Identify the domain for the following function. $f(x) = \sqrt{-4x + 5}$

Let $f(x) = 2x^2 - 3x + 1$ $g(x) = \dfrac{2x-3}{x+2}$ $h(x) = \dfrac{1}{5}x - 7$

18. Find $f(-3) - h(2)$.

A) 27.75

B) 34.6

C) 7.75

D) -7.75

Let $f(x)=2x^2-3x+1$ $\quad g(x)=\dfrac{2x-3}{x+2}$ $\quad h(x)=\dfrac{1}{5}x-7$

19. Find $h(g(-1))$.

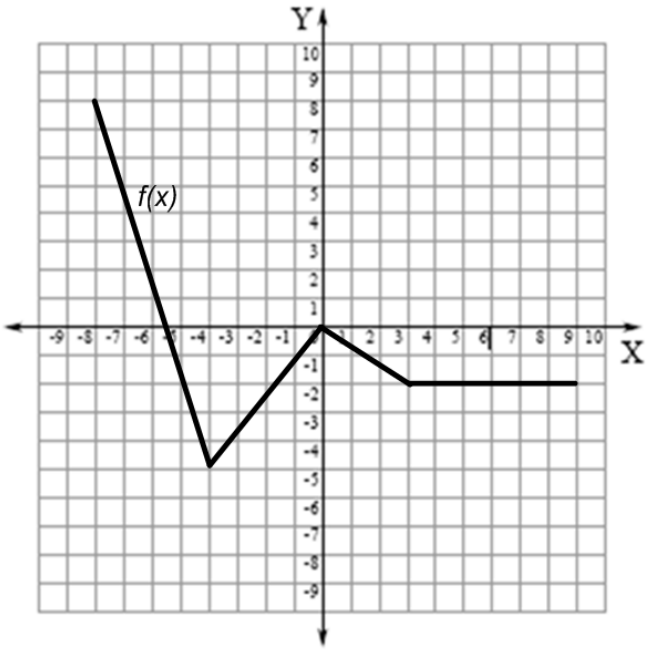
A) 2

B) -2

C) -8

D) 8

20. Which statement about the function f(x) is **not true**.




A) $f(-4)=-5$ *and* $f(0)=0$

B) $f(-2)=-2$ *and* $f(-2)=4$

C) $f(-5.5)=0$ *and* $f(0)=0$

D) $f(-8)=8$ *and* $f(9)=-2$

21. Suppose the *Mighty Mustang Team* is selling tickets to its annual Powder Puff Game. The stadium seats 500 people. For this particular game, the amount of money collected is a function of the number of people, *n*, in attendance. Each ticket for the game costs $5.00. Which of the following statements is **not true** regarding this situation?

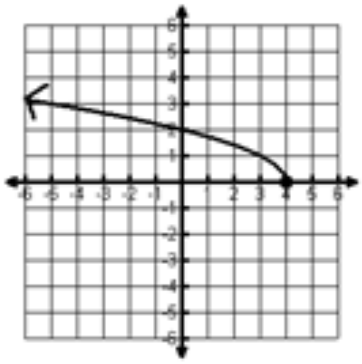
A) The function $f(n)=5n$ describes the amount of money collected at the game.

B) The amount of money collected depends on the number of people, *n*, in attendance.

C) A reasonable range for this function is $n=\{0,5,10,15,\ldots,\}$

D) This function represents discrete data.

22. The graph to the right represents *f(x).* Which statement below describing *f(x)* is true?



A) The range is $[0,\infty)$ and *f(x)* does not represent a function.

B) The range is $(-\infty,\infty)$ and *f(x)* represents a function.

C) The domain is $(-\infty,4]$ and *f(x)* does not represent a function.

D) The domain is $(-\infty,4]$ and *f(x)* represents a function.

23. Which statement about quadratic parent function is true?

A) The domain and range is all real numbers.

B) The vertex is (0, 0)

C) The graph of the quadratic parent function is a parabola that opens down.

D) The range is all real numbers.

24. Given a function *f(x)*, which of the following functions accurately describes *f(x)* with a reflection across the x axis, a horizontal translation right 3 units, and a vertical translation up 7 units.

A) $g(x)=-f(x-3)+7$

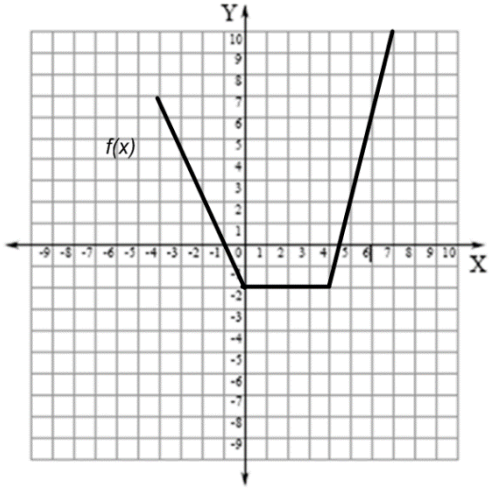
B) $g(x)=f(-x-3)-7$

C) $g(x)=-f(x+3)+7$

D) $g(x)=f(-x+3)-7$

25. The function *f(x)* has a domain of {-4 < x < 2} and a range of {-1 < y < 6}. What is the domain and range of *g(x)* if *g(x) = -f(x – 3)*?

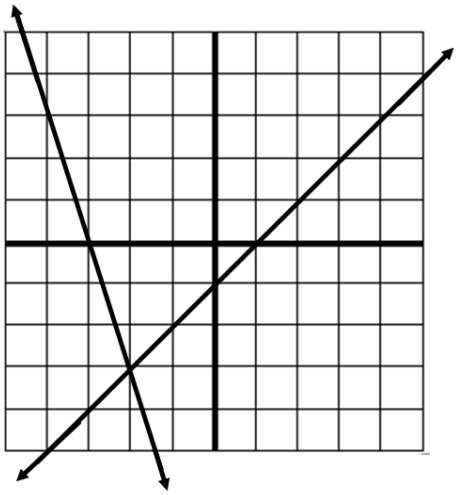
26. The function *f(x)* is graphed to the right. If $g(x)=2f(x-3)+4$, find the new location of the original point with coordinates (0, -2).




27. Write the function which translates $f(x)=|x|$ left 7 units and down 5.

28. Consider the following system of equations $\begin{cases} x-\frac{1}{3}y=-2 \\ 6x+2y=-12 \end{cases}$. What is the solution to the system?

29. Which system of equations represents the following graph?



A) $\begin{cases} x=-2 \\ y=-3 \end{cases}$

B) $\begin{cases} 3x+y=-9 \\ x-y=1 \end{cases}$

C) $\begin{cases} x+y=1 \\ 3x-y=-9 \end{cases}$

D) $\begin{cases} y=3x-9 \\ y=-x+1 \end{cases}$

30. Bryan has a combination of nickels and dimes worth $2.90. If he has a total of 35 coins, how many nickels does he have?

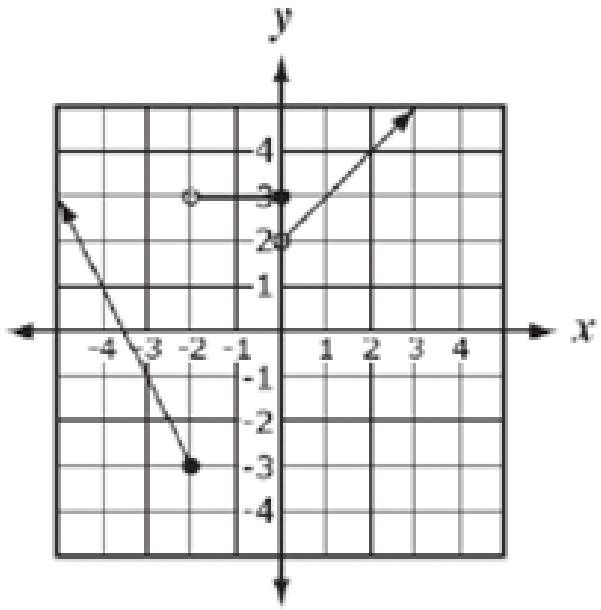
31. Which function is best represented by the graph?

A. $f(x)=\begin{cases}-2x-3.5 & \text{for } x\le -2\\ 3 & \text{for } -2<x\le 0\\ x+2 & \text{for } x>0\end{cases}$

B. $f(x)=\begin{cases}-2x-7 & \text{for } x\le -2\\ 3 & \text{for } -2<x\le 0\\ 2x & \text{for } x>0\end{cases}$

C. $f(x)=\begin{cases}-2x-7 & \text{for } x\le -2\\ 3 & \text{for } -2<x\le 0\\ x+2 & \text{for } x>0\end{cases}$

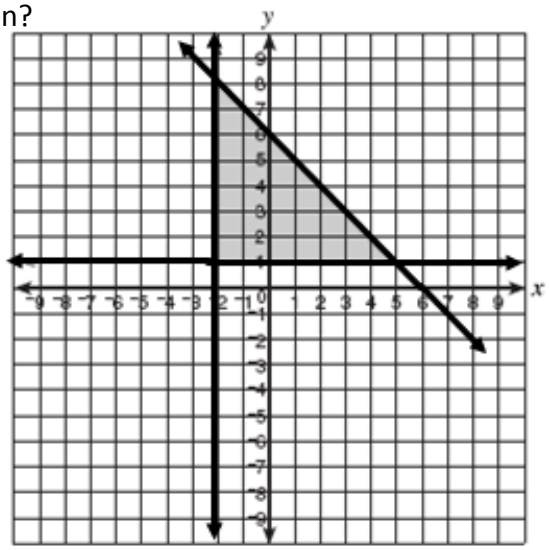
D. $f(x)=\begin{cases}-2x-7 & \text{for } x\le -2\\ 3x & \text{for } -2<x\le 0\\ x+2 & \text{for } x>0\end{cases}$




32. What is the solution of this system?

$$\begin{cases}5x-2y+z=0\\ 2x-y+z=-3\\ 3x+4y=18\end{cases}$$

33. Which set of constraints produced the shaded feasible region?



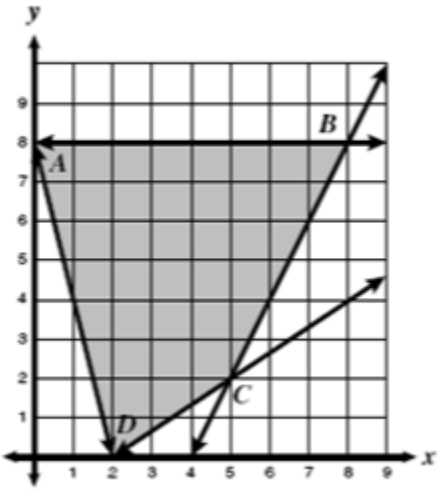
A. $\begin{cases} y \geq 6 - x \\ x \geq 1 \\ y \geq -2 \end{cases}$

B. $\begin{cases} x + y \leq 6 \\ x \geq -2 \\ y \geq 1 \end{cases}$

C. $\begin{cases} x \leq 6 - y \\ x \geq 1 \\ y \leq 2 \end{cases}$

D. $\begin{cases} x + y \leq 8 \\ x - y \leq 6 \\ x \geq -2 \\ y \geq 1 \end{cases}$

34. The graph of the linear programming model consists of polygon ABCD and its interior. Under these constraints, which is the point where the maximum value of $4x + 3y$ occurs?



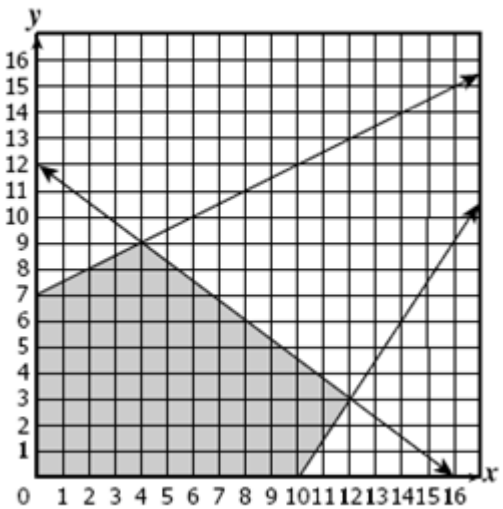

A. $A$

B. $B$

C. $C$

D. $D$

35. What appears to be the maximum value of $P = 5x + 6y$ for the feasible region in the graph?



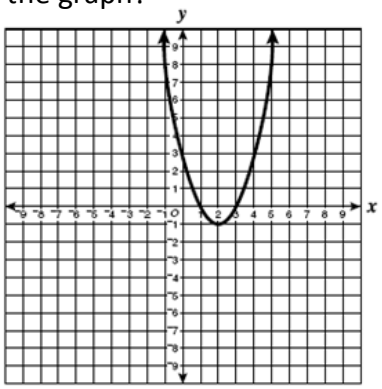

A. 72

B. 74

C. 78

D. 80

36. Which of the following is most likely the equation of the graph?



A. $f(x)=(x-2)^2-1$

B. $f(x)=(x-2)^2+1$

C. $f(x)=(x+2)^2+1$

D. $f(x)=5(x-1)^2-2$

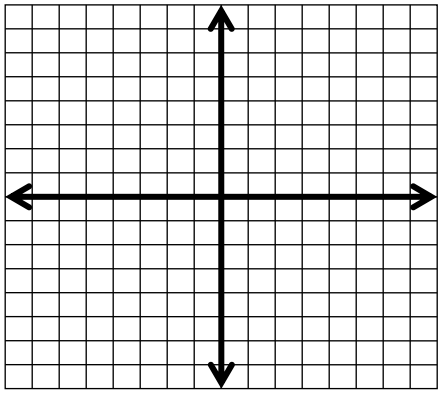
37. What are the coordinates of the vertex of $f(x)=\frac{2}{3}(x-4)^2+1$?

38. In the function $f(x)=a(x-4)^2$, where $a>0$, what happens to the graph of $f$ as the value of $a$ increases?

39. Which of the following sentences is true about the graphs of $y=3(x-5)^2+1$ and $y=3(x+5)^2+1$?

A. Their vertices are maximums.
B. The graphs have the same shape with different vertices.
C. The graphs have different shapes with different vertices.
D. One graph has a vertex that is a maximum while the other graph has a vertex that is a minimum.

40. Graph the quadratic function $f(x)=x^2+10x+25$?



41. Factor: $9x^2 - 12x + 4$

42. What are the solutions of the fuction $f(x) = 3x^2 + 17x - 6$?

43. What is the nature of the roots of the equation $5n^2 = 4n + 6$.

A. two imaginary roots
B. one real, rational root
C. two real, irrational roots
D. two real, rational roots

44. Which equation is equivalent to $y = 3x^2 + 6x + 5$?

A. $y = 3(x+3)^2 - 9$
B. $y = 3(x+3)^2 - 4$
C. $y = 3(x+1)^2 + 4$
D. $y = 3(x+1)^2 + 2$

45. Factor: $x^2 - 36z^2$

46. Jenny is solving the equation $x^2 - 8x = 9$ by completing the square. What number should be added to both sides of the equation to complete the square?

A. 9 B. 4 C. 64 D. 16

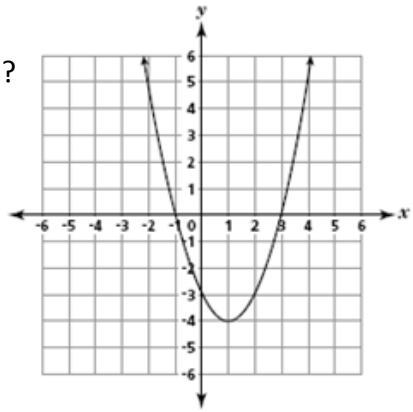
47. If $x^2 - 5x + 6 = (x-h)^2 + k$, what is the value of k?

A. $-\frac{25}{4}$ B. $-\frac{5}{2}$ C. $-\frac{1}{4}$ D. $6$

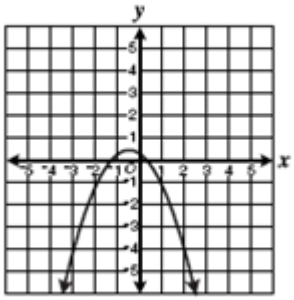
48. What is the range of the equation $f(x) = 25x^2 - 30x + 16$?

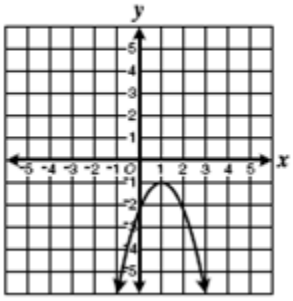
A. $[16, \infty)$ B. $[7, \infty)$ C. $[\frac{16}{25}, \infty)$ D. $[\frac{3}{5}, \infty)$

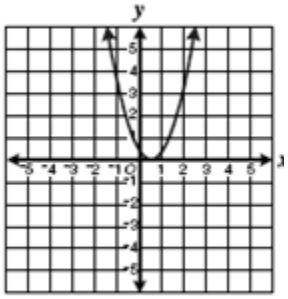
49. What are the roots of the graph of this quadratic equation?

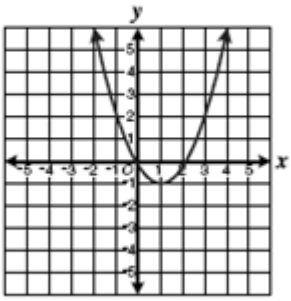


50. Which graph represents a quadratic equation with no real solutions?

A. 

B. 

C. 

D. 

51. What are the roots of the equation $3x^2 - x + 2 = 0$

52. The height h of a golf ball in feet t seconds after it is hit into the air is modeled by $h(t) = -16t^2 + 64t$. How long is the ball in the air?

53. A farmer wants to enclose his pasture which is bordered by a river. If he uses 750 feet of fencing on three sides of the field, what is the largest area he can enclose?

54. Which statement about the function $g(x) = -\frac{1}{2}(x-5)^2 + 2$ is not true?

A) There is a shift right 5.
B) There is a shift up 2.
C) It is reflected across the y-axis.
D) There is a vertical compression by $\frac{1}{2}$.

55. Write the correct representation of the quadratic function.
The parent function $f(x) = x^2$ is vertically stretched by a factor of 4 and translated 1 unit left and 5 units down to create $h(x)$.

56. Which statement is true about the following function $f(x) = -3x^2 + 6x + 9$.

A) The graph opens up.
B) The vertex is (1, 12).
C) The range is $y \leq 9$.
D) The axis of symmetry is $x = -1$

57. What are the roots of the equation: $16x^2 - 8x = 0$?

58. What are the solutions to the following equation: $\frac{1}{2}(x-1)^2 = 12$

59. What term would go in the blank if you were to complete the square?

$x^2 + 12x + \_\_\_\_\_$

60. An airline sells a 3-day vacation package. Sales from this vacation package can be modeled by the quadratic function $a(p) = -12p^2 + 36000p$. Sales are dependent of the price, $p$, of the package. If the price is set too high, the package won't sell, but if the price is too low, prospective buyers will think it's a scam. At what price does the company have the greatest revenue?

a) $1500
b) $3000
c) $27000000
d) $3600

61. The dosage d of a drug that a physician prescribes varies directly as the patient's mass m, and d = 100 mg when m = 65 kg. Find d to the nearest milligram when m = 90 kg.

62. For what values of the variable is the expression undefined? $\dfrac{4x^6}{2x-6}$

63. Simplify the following expression. $\dfrac{\dfrac{2}{x}+\dfrac{x}{4}}{\dfrac{x+1}{x}}$

64. Subtract the following rational expressions. $\dfrac{3x-2}{2x+5}-\dfrac{2}{5x-2}$

65. Given the following function, identify the zeros and the vertical asymptotes.

$\dfrac{x^2-x-12}{x}$

66. Identify the holes in the graph of the following function: $\frac{x^2-9}{x-3}$

66. Simplify the following expression. $2\sqrt[3]{54}-3\sqrt[3]{2}$

A) $3\sqrt[3]{2}$ B) $\sqrt[3]{2}$ C) $-\sqrt[3]{2}$ D) 0

67. Solve the following radical equation. $3\sqrt[3]{x}-2=16$

68. Solve the following radical equation. $\sqrt{x+5}=x-1$

69. Solve the following radical equation. $(3x+3)^{\frac{2}{3}}=36$

70. What would the expression $\sqrt[3]{4^2}$ written with an exponent look like?

71. How many roots (real or imaginary) will the following expression have: $\sqrt[2]{-216}$

72. Simplify the following expression: $\dfrac{\left(2a^4b\right)^2}{\left(3ac^4\right)\left(4a^5b\right)}$

73. Which of the following is not a transformation of the following function from its parent function?
$y=-2\sqrt{x-3}+4$

A) vertical stretch

B) shift up 4 units

C) shift right 3 units

D) reflection over the y-axis

74. **True / False** The following functions demonstrate exponential decay.

$f(x)=.5(1+.03)^x$ $\qquad$ $f(x)=\dfrac{7}{8}(1.4)^x$

75. You purchased a new car for $22,500 in 2008. The value of the car decreases by 16% each year. Which equation below can be used to calculate the value of the car in 2014?

A) $V=22500(1-16)^{14}$

B) $V=22500(1-16)^6$

C) $V=22500(1-.16)^6$

D) $V=22500(1+.16)^6$

76. Rewrite in exponential form: $\log_7 343=3$

77. Which expression below is equivalent to the following? $\log_3 \frac{x^2 y}{5}$

A) $\frac{\log x^2 y}{\log 5}$

B) $\left(\frac{x^2 y}{5}\right)\log_3$

C) $2\log_3 x + \log_3 y - \log_3 5$

D) $2\log_3 x + \log_3 x + \log_3 y - \log_3 5$

78. Solve the following logarithmic equation. $\log_7(-x+6) = 2$

79. Solve the following logarithmic equation. $3\ln x + 4\ln x = 14$

80. Solve the following logarithmic equation. $10^{4x} + 8 = 15$

81. Between what consecutive integers must the solution to $\log_2 60$ lie?

A) 4 and 5 B. 5 and 6 C. 30 and 31 D. 14 and 15

82. Find the difference. $\left(4x^2 - 3x^3 + 8x - 1\right) - \left(6x^3 + 5x - 4\right)$

83. Find the product. $\left(3x^2 + x - 5\right)\left(2x - 1\right)$

84. Find the quotient using synthetic division. $\left(x^3-5x^2-18x+28\right)\div\left(x-7\right)$

85. What is the 6th row of Pascal's triangle? (Count the apex, 1, as the first row.)

A. 1 3 6 3 1 B. 1 4 6 4 1 C. 1 4 9 9 4 1 D. 1 5 10 10 5 1

86. Which is a factor of $x^3+64$?

A. $x-4$ B. $x+4$ C. $x-8$ D. $x+8$

87. How <u>many</u> solutions does the equation $y=x^5-6x^3+4x$ have?

88. The polynomial function $f\left(x\right)=2x^3-15x^2+6x+7$ has one zero at $x=1$. What are the other zeros of $f\left(x\right)$ (use synthetic division)?

89. Which of the following functions of $x$ has the greatest number of roots in the complex (imaginary) number system?

A. $y=x+x^2$ B. $y=-x+3$ C. $y=x^2-4x+2$ D. $y=x^3+x^2-1$

90. What are the zeros of the polynomial function $f\left(x\right)=2x^3+3x^2+8x+12$?

A. $-\frac{3}{2},\ -2i,\ 2i$ B. $-\frac{3}{2}i,\ -2i,\ 2i$ C. $-3,\ -2i,\ 2i$ D. $-3,\ i,\ -i$