

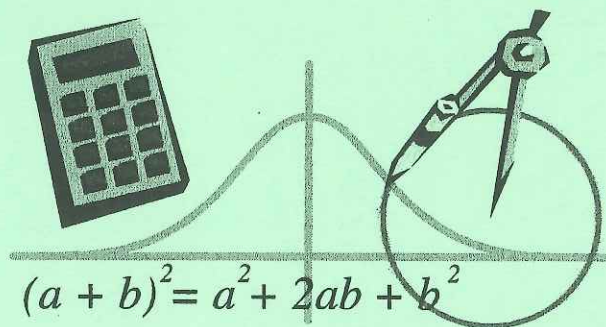
TIME TO ROCK THE
ALGEBRA 2 SOL



ALGEBRA 2

SOL FOLDER

MAY 2012



___1. What is the simplest form of

$$\frac{2x+2}{x^2-1} ?$$

- A $\frac{1}{x+1}$
- B $\frac{2}{x+1}$
- C $\frac{1}{x-1}$
- D $\frac{2}{x-1}$

___2. Which of the following is equivalent

$$\frac{\frac{1}{x} + \frac{3}{y}}{\frac{3}{x} + \frac{2}{y}} ?$$

- F $\frac{3x+y}{2x+3y}$
- G $\frac{3x+2y}{2x+3y}$
- H $\frac{x+y}{2x+3y}$
- J 1

___3. What is the simplest form of

$$\sqrt{12} + \sqrt{27} + \sqrt{75} ?$$

- A $2\sqrt{3}$
- B $3\sqrt{2}$
- C $10\sqrt{3}$
- D $\sqrt{114}$

___4. Which statement is the simplest

$$\text{form of } \sqrt[4]{16x^8y^3} ?$$

- F $2x^2y^{\frac{3}{4}}$
- G $2x^2y^3$
- H $4x^2y^{\frac{3}{4}}$
- J $16^{\frac{1}{4}}x^{\frac{8}{4}}y^{\frac{3}{4}}$

___5. Which is equivalent to $(i^2)^3$?

- A -1
- B 1
- C i
- D $-i$

6. TEQ: Which is equivalent to:

$$(7 - 4i)(5 - 2i) ?$$

Put answer in the box.

___7. Which is a factored form of

$$3x^2 - 5x + 2 ?$$

A $(3x-2)(x+1)$

B $(3x-1)(x+2)$

C $(3x-2)(x-1)$

D $(3x+1)(x-2)$

___8. Which is a factored form of

$$125x^3 - 45x ?$$

F $5x(5x+3)(5x-3)$

G $5(25x+3)(5x-3x)$

H $5x(5x-3)(5x-3)$

J $5x(5x+3)(5x+3)$

___9. Which expression represents this

product $\frac{x+5}{2x+4} \cdot \frac{x^2-4}{x+5} ?$

A $\frac{x-2}{2}$

B $\frac{x+2}{2}$

C $\frac{x+5}{2(5+x)}$

___10. What is the simplest form of

$$2\sqrt[3]{54} + 3\sqrt[3]{16} ?$$

F $5\sqrt[3]{70}$

G $12\sqrt[3]{2}$

H $12\sqrt[3]{3}$

J $5\sqrt[3]{2}$

___11. Which is a factored form of

$$64x^3 + 1 ?$$

A $(4x+1)^3$

B $(4x+1)(16x^2 + 4x + 1)$

C $(4x+1)(16x^2 - 4x + 1)$

D $(4x+1)(16x^2 - 4x - 1)$

___12. Which of the following could be the length of the side of a rectangle whose area measures $d^2 + 3d - 18$?

F $d + 6$

G $d + 3$

H $d - 18$

J $d + 1$

13. TEQ: What is the simplest form of

$$3(4 + 8i) - 2(-3 + 12i) ?$$

Put your answer in the box.

___14. Which is equivalent to

$$\frac{3x^2 - 6x - 24}{144 - 9x^2} \div \frac{x+2}{x+4} ?$$

F -1

G -1/2

H -1/3

J 1/3

___15. Which of the following represents i ?

A i^{11}

B i^{24}

C i^{37}

D i^{47}

___16. Which statement is equivalent to

$$9n - \frac{6n+3}{3} ?$$

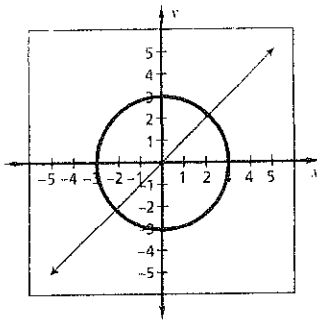
F $n+1$

G $n-1$

H $7n+1$

J $7n-1$

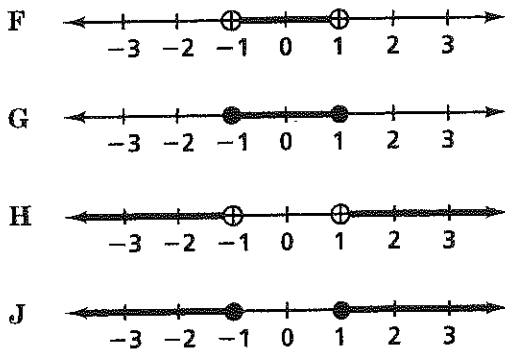
1.



Which is most likely the solution set for the system shown above?

- A $\{(0, 0)\}$
- B $\{(2.1, 2.1), (-2.1, -2.1)\}$
- C $\{(2.1, -2.1), (-2.1, 2.1)\}$
- D $\{(2.1, -2.1), (0, 0), (-2.1, 2.1)\}$

2. Which graph represents the solution to $|x| < 1$?



3. What is the solution to $|4x + 1| \geq 3$?

- A $x \leq -1$ or $x \geq \frac{1}{2}$
- B $-1 < x < \frac{1}{2}$
- C $-1 \leq x \leq \frac{1}{2}$
- D $x < -1$ or $x > \frac{1}{2}$

4. A brick falls from the top of a tall building. The distance, in feet, between the brick and the ground t seconds after it falls is given by $d = -16t^2 - 4t + 446$. How long after the brick falls is it 390 feet from the ground?

- F $\frac{7}{4}$ sec
- G $\frac{9}{4}$ sec
- H 2 sec
- J 3 sec

5. What is the solution set for $x^2 = 3x + 4$?

- A $\{-1, 4\}$
- B $\{1, -4\}$
- C $\{1, 4\}$
- D $\left\{\frac{-3 \pm i\sqrt{7}}{2}\right\}$

6. What is the solution set for $x^2 + 2x + 5 = 0$?

- F $\{1 \pm \sqrt{6}\}$
- G $\{-1 \pm \sqrt{6}\}$
- H $\{1 \pm 2i\}$
- J $\{-1 \pm 2i\}$

7. What is the solution to $\frac{2x-1}{2} = \frac{x}{5}$?

- A $x = -\frac{1}{4}$
- B $x = \frac{1}{8}$
- C $x = \frac{5}{8}$
- D $x = \frac{5}{4}$

8. What is the solution set for $25x^2 - 100 = 0$?

- F {2}
- G {4}
- H {-2, 2}
- J {-4, 4}

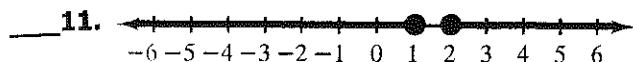
9. Which of the following equations are you solving if

$$x = \frac{-6 \pm \sqrt{(6)^2 - 4(-3)(7)}}{2(-3)}$$

- A $-3x^2 - 6x + 7 = 0$
- B $-3x^2 + 6x + 7 = 0$
- C $3x^2 + 6x + 7 = 0$
- D $-3x^2 + 6x - 7 = 0$

10. Which of the following represents the solution to $|2x - 1| = x$?

- F $x = \frac{1}{3}$
- G $x = 0$
- H $x = 1$
- J $x = \frac{1}{3}$ or $x = 1$



Which inequality best describes the solution set shown above?

- A $|x - 1| > 1$
- B $|x + 1| \leq 2$
- C $|2x - 3| > 1$
- D $|4x - 6| \geq 2$

12. What is the solution set for $2x^2 - 2x - 2 = 0$?

- A $\left\{ \frac{1 \pm 2\sqrt{5}}{2} \right\}$
- B $\left\{ \frac{-1 \pm \sqrt{5}}{2} \right\}$
- C $\left\{ \frac{1 \pm \sqrt{5}}{2} \right\}$
- D $\left\{ \frac{-1 \pm 2\sqrt{5}}{2} \right\}$

13. What is the solution set for $x^2 - 1 = 0$?

- F {1}
- G $\{-i\}$
- H $\{-1, 1\}$
- J $\{-i, i\}$

14. What is the solution set for $\sqrt{x + 56} = x$?

- A {0}
- B {8}
- C {8, -7}
- D $\{-8, 7\}$

___15. What is the solution set for the equation below?

$$\frac{x}{x-1} + \frac{x}{2} = \frac{1}{1-x}$$

- A {-1}
- B {2}
- C {0,2}
- D {1,2}

___16. Which of the following statements describes the solutions for the equation $9x^2 - 12x + 4 = 0$?

- F All real numbers
- G Two distinct real solutions
- H Only one distinct real solution
- J Two complex solutions

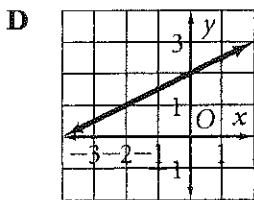
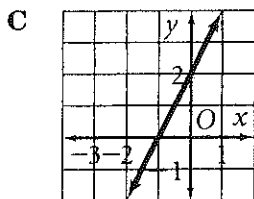
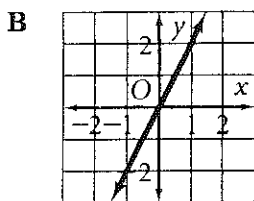
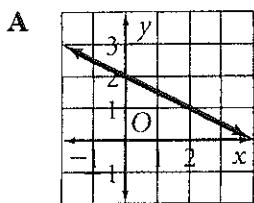
___17. TEQ: Solve the following system of equations:

$$\begin{cases} y = x^2 - 6x \\ y = \frac{1}{4}x^2 - 9 \end{cases}$$

Select all of the following points that are solutions to this system by selecting each point. (You just check each one that is a solution)

(0, 6)	
(6, 0)	*
(7, 7)	
(2, -8)	*
(-2, 8)	

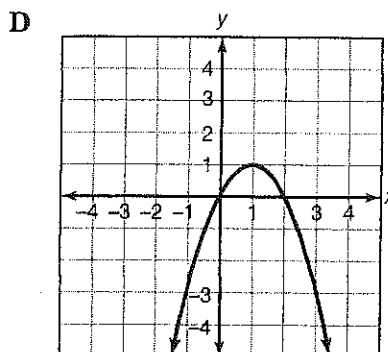
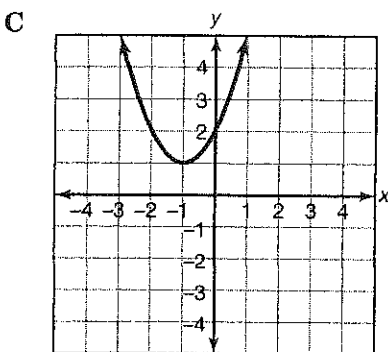
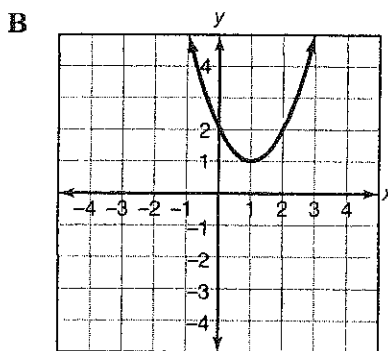
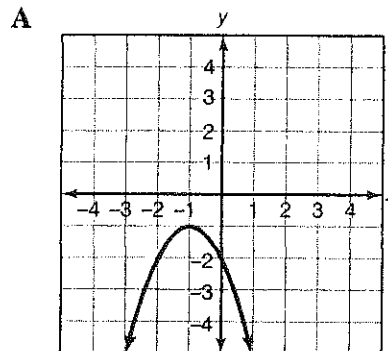
___1. Which best represents the graph of $y = \frac{1}{2}x + 2$?



___2. What are the zeroes of $f(x) = (x - 5)(x - 3)(x + 2)$?

- F 0, 5, 3, and -2
- G 0, -5, -3, and 2
- H 1, 5, 3, and -2
- J 1, -5, -3, and 2

___3. Which best represents the graph of $y = x^2 - 2x + 2$?



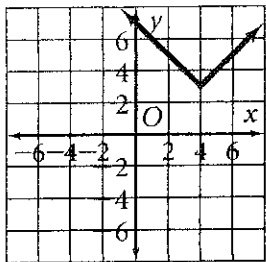
4. If $f(x) = -x^2 + 6x - 5$, what is $f(2)$?

- F 53
- G 11
- H 3
- J 1

5. If $f(x) = \frac{1}{x+1}$ and $g(x) = x^2$, which of the following expressions represents $f(g(x))$?

- A $\frac{1}{(x+1)^2}$
- B $\frac{1}{x^2+1}$
- C $\frac{x^2}{x+1}$
- D $\left(\frac{1}{x+1}\right)^2$

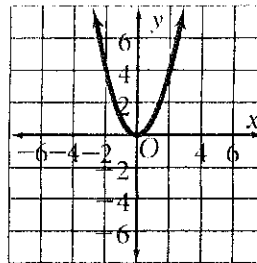
6.



Which most likely represents the equation of the graph above?

- F $y = (x - 4) + 3$
- G $y = |x - 4| + 3$
- H $y = |x - 3| + 4$
- J $y = |x + 4| - 3$

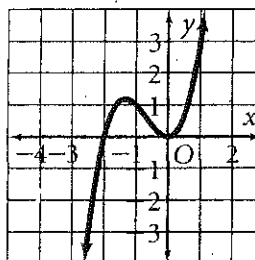
7.



The graph of $f(x)$ is shown above. What is the solution set for $f(x) = 0$?

- A $\{0\}$
- B $\{1\}$
- C $\{-2, 2\}$
- D $\{-3, 3\}$

8.



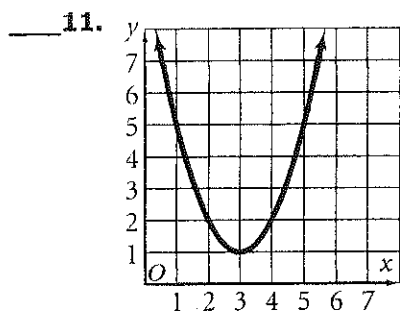
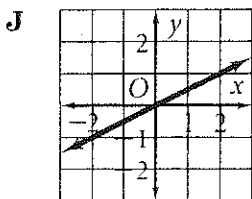
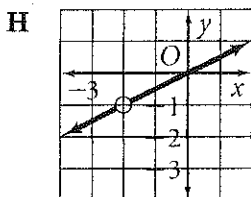
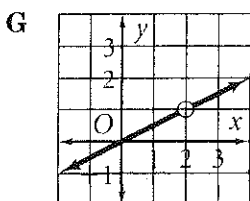
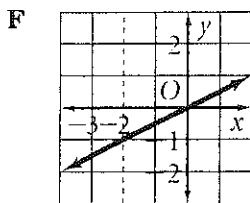
What are the x -intercepts of the graph of the polynomial shown above?

- F -1.3 and 0
- G -2.5 and 1
- H -2 and 0
- J 0 and 1

9. If $f(x) = x - 2$ and $g(x) = \frac{x+5}{5}$, which of the following expressions represents $g(f(x))$?

- A $\frac{x+3}{5}$
- B $\frac{x^2+3x-10}{5}$
- C $\frac{6x-5}{5}$
- D $\frac{x-5}{5}$

10. Which of the following best represents the graph of $y = \frac{x^2 + 2x}{2(x + 2)}$?

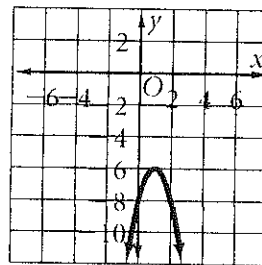


Which most likely represents the equation of the graph above?

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

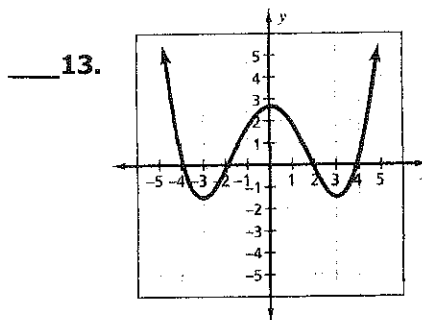
12. Which is the inverse of $f(x) = \frac{x + 9}{7}$?

- A $f^{-1}(x) = \frac{7}{x + 9}$
- B $f^{-1}(x) = -7x + 56$
- C $f^{-1}(x) = 7x - 9$
- D $f^{-1}(x) = 9x + 7$



The graph of $f(x)$ is shown above. How many real solutions are there to $f(x) = 0$?

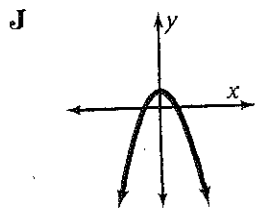
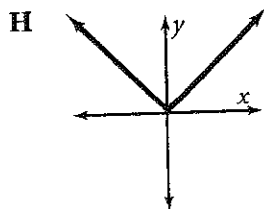
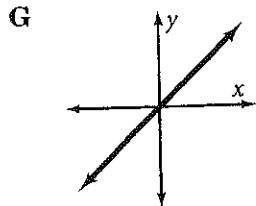
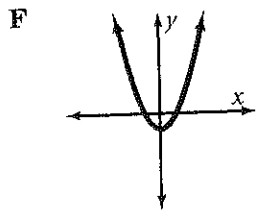
- F 0
- G 1
- H 2
- J 3



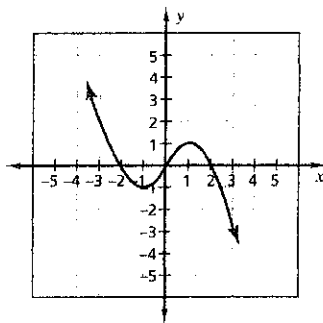
The graph of $f(x)$ is shown above. What is the solution set for $f(x) = 0$?

- A $\{2.5\}$
- B $\{-3, 3\}$
- C $\{-3, 0, 3\}$
- D $\{-4, -2, 2, 4\}$

14. Which best represents the graph of $y = |x|$?



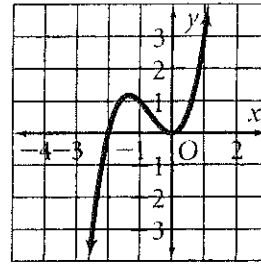
15.



What are the linear factors of the polynomial shown on the graph?

- A $x - 1$ and $x + 1$
- B $x - 2$ and $x + 2$
- C $x, x - 1$ and $x + 1$
- D $x, x - 2$ and $x + 2$

16.



What are the x -intercepts of the graph of the polynomial shown above?

- F -1.3 and 0
- G -2.5 and 1
- H -2 and 0
- J 0 and 1

17. Which polynomial has zeros at 1, 2, and 4?

- A $(x + 1)(x + 2)(x + 4) = 0$
- B $x^2 - 3x + 2 = 0$
- C $x^3 - 7x^2 + 14x - 8 = 0$
- D $x^3 - 7x^2 - 10x + 8 = 0$

- ___1. The Fibonacci Sequence is shown below.

1, 1, 2, 3, 5, 8, 13, ...

What is the ninth term in the sequence?

- A 14
B 18
C 19
D 34

- ___2. What is the sum of the first 6 terms of the series $2 - 6 + 18 - 54 + \dots$?

- F 122
G -364
H 1094
J -40

- ___3. Which of the following series is described by $\sum_{n=2}^6 (n^2 - 1)$?

- A $0 + 3 + 8 + 15 + 24 + 35$
B $3 + 8 + 15 + 24 + 35$
C $1 + 4 + 9 + 16 + 25 + 36$
D $8 + 15 + 24 + 35$

- ___4. Is the sequence arithmetic? If so, what is the common difference?

-0.9, 13, 27, 40.8

- F no
G yes, 14.1
H yes, 13.8
J yes, 13.9

- ___5. If y varies directly with x , and $x = 4$ when $y = 18$, what is the value of x when $y = 90$?

- A 405
B 76
C 20
D 9

- ___6. If y varies inversely with x , and $x = 2$ when $y = 1$, what is the value of x when $y = 10$?

- F 0.2
G 0.5
H 2
J 20

- ___7. The amount a spring will stretch S varies directly with the force (or weight) F attached to the spring. If a spring stretches 0.56 inches when 11.2 pounds is attached, about how far will it stretch when 17.6 pounds is attached?

- A 0.5 in.
B 0.05 in.
C 880 in.
D 0.88 in.

- ___8. Wind chill factor (W) varies directly with temperature (T) and inversely with the wind velocity (v). If k is the constant of proportionality, which formula represents this relationship?

- A $W = kTv$
B $W = \frac{kv}{T}$
C $W = \frac{kT}{v}$
D $W = \frac{kT}{v^2}$

9. Driving a piling into a harbor bottom, a pile driver sinks the piling 24 inches on the first stroke, 18 inches on the second stroke, and 13.5 inches on the third stroke. If the sequence is continued, how far will the piling be driven down on the 5th stroke?

- A $1\frac{1}{2}$ in.
- B $4\frac{1}{2}$ in.
- C 6 in.
- D $7\frac{19}{32}$ in.

10. If $a_n = 1 + \frac{1}{n}$, then what is a_9 ?

- A $\frac{11}{10}$
- B $\frac{10}{9}$
- C $\frac{9}{8}$
- D $\frac{3}{2}$

11. The table below shows the value of a certain collectible baseball card over eight years.

Year (x)	Value (y) (in dollars)
1	3
2	5
3	9
4	18
5	29
6	43
7	51
8	69

Which exponential equation best represents the data?

- F $y = 2.18(6.1)^x$
- G $y = 14.8(9.58)^x$
- H $y = 0.53(1.01)^x$
- J $y = 2.25(1.59)^x$

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12.

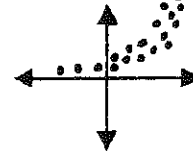
x	y
0	1
1	3
-1	$\frac{1}{3}$
2	9
-2	$\frac{1}{9}$
3	27
-3	$\frac{1}{27}$

Which function includes all the ordered pairs in the table

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

13. Look at the given scatterplot. This data best fits what type of equation?

- F. linear
- G. exponential
- H. logarithmic
- J. quadratic



14. What type of function is $y = 2^x + 8$?

- A Linear
- B Exponential
- C Cubic
- D Quadratic

15. In how many ways can 2 letters from the word PROBLEMS be arranged?

- A 16
- B 56
- C 60
- D 124

16. How many permutations can be made using all of the letters in the word GENESIS?

- A 210
- B 840
- C 1260
- D 5040

17. TEQ: The number of seals observed during a wildlife survey was normally distributed with a mean of 73 and a standard deviation of 14.1. Find the probability that AT MOST 50 seals were observed during a survey.

a) Find the z-score $z = \frac{x - \mu}{\sigma}$

- b) Find the probability using your table or your calculator.

18. TEQ: The mean of a data set is 163 and the standard deviation is 5. What percent of the data is between 148 and 158?

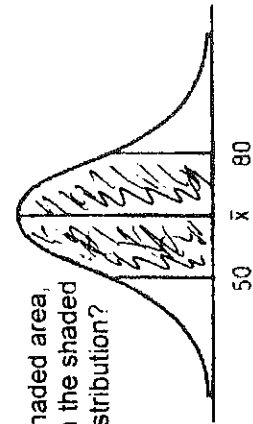
19. Use your standard normal bell curve to find the following area under the curve:

$$P(\mu - \sigma \leq x \leq 2\sigma)$$

- A 68%
B 95%
C 81.5%
D 99%

20. How many different 4-person committees can be formed from a group of six boys and four girls ?

- A. $\frac{10!}{4!}$ B. ${}_{10}C_4$ C. ${}_{10}P_4$ D. ${}_6C_2 {}_4C_2$



21. In the accompanying diagram, about 68% of the scores fall within the shaded area, which is symmetric about the mean. The distribution is normal and the scores in the shaded area range from 50 to 80. What is the standard deviation of the scores in this distribution?

- A. 7.5 B. 15 C. 30 D. 65

#1

1 Which number is equivalent to $(32)^{\frac{3}{5}}$?

- A 2
B 6
C 8
D 16

2 For non-zero denominators, which expression

is equivalent to $\frac{5x-15}{(x-3)(x+3)}$?

F $\frac{-10}{x-9}$

G $\frac{5}{x-3}$

H $\frac{10}{9}$

J $\frac{5}{x+3}$

3 If $x \neq 0$, which is equivalent to the following expression?

$$\frac{y+z}{x} - \frac{z}{x}$$

A $\frac{y+2z}{x}$

B $\frac{y}{x}$

C $\frac{y}{x-z}$

D $\frac{y-x}{x-z}$

4 When completely factored, $2x^2 + 2x - 24$

is equivalent to —

F $2(x-3)(x+4)$

G $2(x+3)(x-4)$

H $2(x+6)(x-2)$

J $(2x-3)(x+8)$

Name: _____

5 Which of the following is equivalent to

$$\sqrt{-72} + \sqrt{-50}?$$

A $11i$

B $-11i$

C $11i\sqrt{2}$

D $i\sqrt{122}$

6 Assuming no denominator is equal to zero, which is equivalent to the following expression?

$$\frac{x(x-2)(x-1)}{(x-4)(x-1)}$$

F $\frac{x-2}{x-4}$

G $\frac{x(x-2)}{x-4}$

H $\frac{x}{2}$

J $\frac{(x-2)}{-4}$

7 Which expression is equivalent to $\sqrt[6]{x^3y^4}$?

A $x^{\frac{1}{2}}y^{\frac{2}{3}}$

B $x^{\frac{1}{2}}y^{\frac{3}{2}}$

C x^2y^4

D $x^2y^{\frac{2}{3}}$

8 Which expression is equivalent to $64x^2 - 81y^2$?

F $(8x+9y)^2$

G $(8x-9y)^2$

H $(8x+9y)(8x-9y)$

J $(8x+9)(8x-9)$

9 What are all the roots for the equation $3|w - 14| - 6 = 21$?

- A 19
- B 23
- C 5 and 23
- D 9 and 19

10 The graph of $y = 3x - 2$ is translated up 5 units. What is the equation of the new graph?

- F $y = 8x - 2$
- G $y = 3x + 3$
- H $y = 3x - 7$
- J $y = 3x + 5$

11 Which equation best represents the data in this table?

x	y
0	1
1	3
2	9
3	19

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

12 Which is a zero of $f(x) = 6x^2 + 5x - 6$?

- F $-\frac{3}{2}$
- G $-\frac{2}{3}$
- H $\frac{3}{2}$
- J 6

13 $y = x^2 - 8x + 15$

What are the x -intercepts of the graph that represents the equation?

(0, 3) and (0, 5) C (-8, 0) and (15, 0)

(3, 0) and (5, 0) D (0, -8) and (0, 15)

14 Given: $a_n = a_1 r^{n-1}$

Which is the 6th term of the geometric sequence for which $a_1 = 4$ and $r = \frac{1}{2}$?

- F $\frac{1}{8}$
- H $\frac{1}{2}$
- G $\frac{1}{16}$
- J 1

15 If y varies jointly with x and z , what is the constant of proportionality when $y = 30$, $x = 4$, and $z = 5$?

- A $\frac{2}{3}$
- C 21
- B $\frac{3}{2}$
- D 24

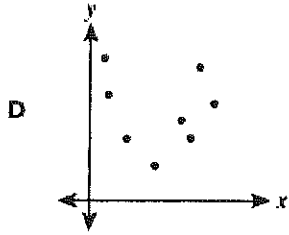
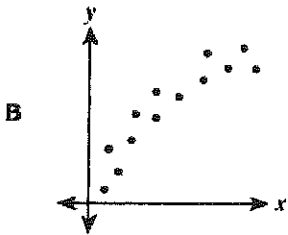
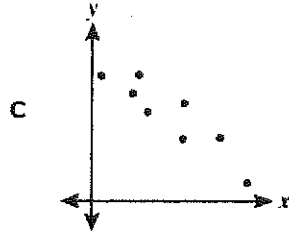
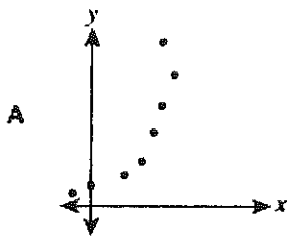
16 Bill rode his bike to a store 5 kilometers from his house. The table shows the distance from the store paired with the number of minutes after leaving the house.

Minutes (x)	Kilometers from Store (y)
0	5
3	4
5	3.2
8	2.9

Which equation best models a line of best fit for the data?

- F $y = -0.2x + 4.5$
- G $y = -0.2x + 6.1$
- H $y = -0.3x + 4.9$
- J $y = -0.3x + 6.4$

17 For which set of data would the equation for the curve of best fit most likely be linear?



18 The height of an object when projected upward can be described by the equation $h = 270t - 4.9t^2$, where h is height and t is time. The relationship between the height of the object and the elapsed time is ---

- F an exponential function
- G a linear function
- H a quadratic function
- J a step function

19 These are the first three terms of an arithmetic sequence.

$$\frac{1}{2}, \frac{3}{4}, 1$$

What are the fourth and fifth terms of the sequence?

- A $\frac{5}{4}, \frac{7}{4}$
- B $\frac{5}{4}, \frac{3}{2}$
- C $\frac{3}{2}, \frac{5}{2}$
- D $\frac{3}{2}, 2$

20 If $f(x) = x^5$ and $g(x) = -2 - 3x^2$, which is $f(g(x))$?

F $\frac{x^5}{-2x - 3x^{10}}$

G $(-2 - 3x^2)^5$

H $(-2 - 3x^{10})^5$

J $-2x^5 - 3x^7$

21 What is the number of turning points in the graph of the function of x defined below?

$$y = 2x^2 + 5x - 7$$

- A 4
- B 3
- C 2
- D 1

22 What is the value of $\sum_{k=1}^4 \left(\frac{1}{4}\right)^k$?

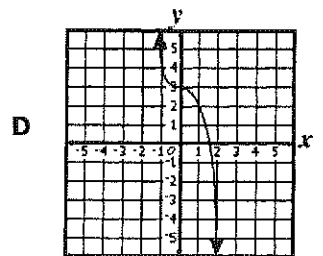
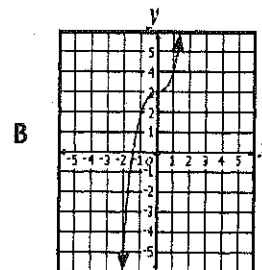
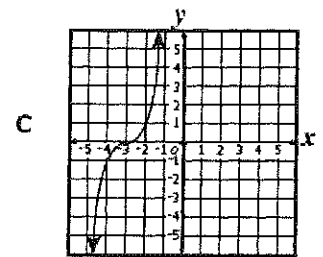
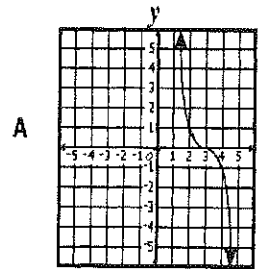
F $\frac{85}{4}$

G $\frac{85}{64}$

H $\frac{85}{256}$

J $\frac{21}{64}$

23 Which graph *most* accurately represents the function $f(x) = -x^3 + 3$?



24 Which equation represents the statement "z varies directly with x and inversely with y"?

F $z = kxy$ H $z = \frac{ky}{x}$

G $z = \frac{kx}{y}$ J $z = \frac{k}{xy}$

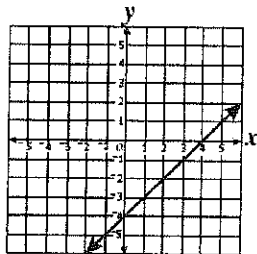
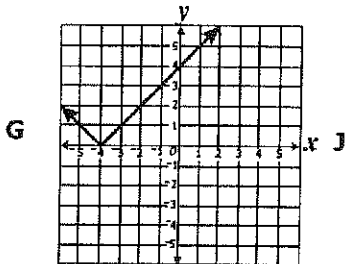
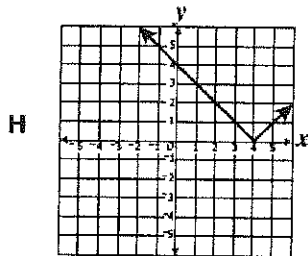
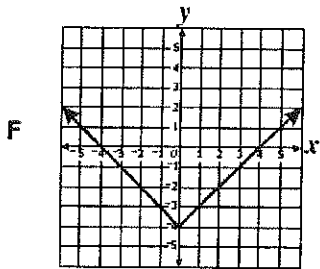
25 Which is the solution set for $2x^2 - 7x + 6 = 0$?

A $\{1.5, 2\}$ C $\{1.5, -2\}$

B $\{-1.5, 2\}$ D $\{-1.5, -2\}$

26 Which graph best represents the following equation?

$$y = |x - 4|$$



27 What is the solution set for the following equation?

$$3\sqrt{x} - 3 = 15$$

A $\left\{\frac{34}{3}\right\}$

B $\left\{\frac{41}{3}\right\}$

C $\{24\}$

$\{28\}$

28 The width of a rectangular window is 2 feet more than its height. If the area is 35 square feet, what is the height?

F 9 ft

G 7 ft

H 5 ft

J 3 ft

29 Which value of x is a solution to the equation below?

$$\frac{\sqrt{2x+2}}{4} = 3$$

A 12.5

B 25

C 50

D 70

30 Which is the solution set of $\left|\frac{1}{2}x - 5\right| = 3$?

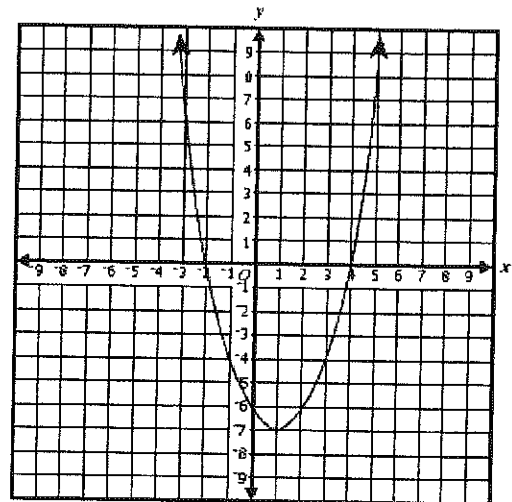
F $\{16\}$

G $\{-16, 16\}$

H $\{-1, 11\}$

J $\{4, 16\}$

31 Which are the apparent zeros of the function shown in the graph?



A $-6, -2, 4$

B $-2, 4$

C $1, -1$

D $2, -4$

32 When $x \neq 0$, what is the solution set for

$$\frac{x-4}{4} = \frac{x-3}{x}?$$

- F {4} G {6} H {2, 6} J {3, 4}

33 What is the solution set to $2x^2 + 5x - 3 = 0$?

- A $\left\{-\frac{3}{2}, -1\right\}$ B $\left\{-\frac{1}{2}, 3\right\}$ C $\left\{-3, \frac{1}{2}\right\}$ D $\left\{\frac{3}{2}, 1\right\}$

34 What are all the roots for the equation

$$|2n - 9| = 5?$$

- F -2 and -7 H 2 and -7
G -2 and 7 J 2 and 7

35 What are the coordinates of the vertex of the graph of $y + 5 = (x - 2)^2$?

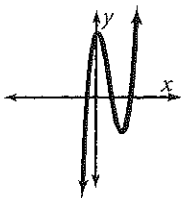
- A (2, -5) B (2, 5) C (-2, 5) D (-2, -5)

36 A polynomial function has a zero at $x = 6$. Which expression must be a factor of the polynomial?

- F $x - 36$ H $x + 6$
G $x - 6$ J $x + 36$

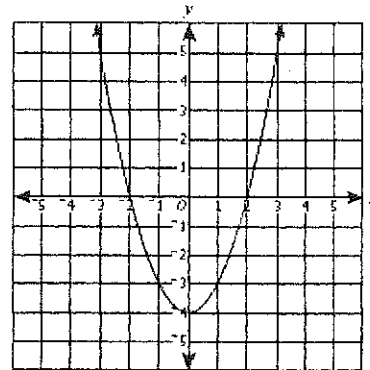
37

The graph below is an example of which type of function?



- A Linear
B Polynomial
C Exponential
D Logarithmic

38 A polynomial function, $P(x)$, is graphed as follows.



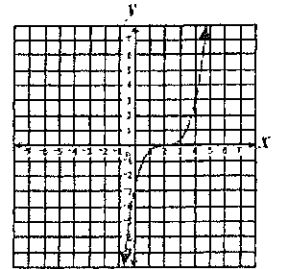
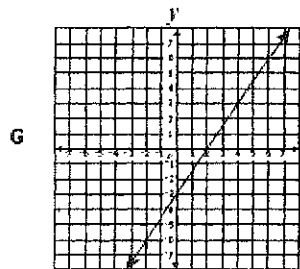
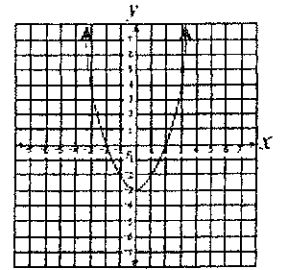
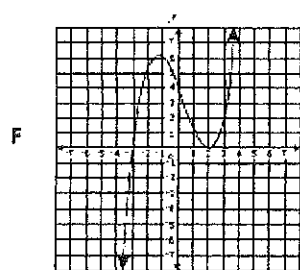
What is the apparent solution set for $P(x) = 0$?

- F {-2, 2} G {-4, 0} H {0, 2} J {-4}

39 What are the x-intercepts for the graph of $y = x^2 + 5x - 6$?

- A (0, 1) and (0, -6) C (0, -1) and (0, 6)
B (1, 0) and (-6, 0) D (-1, 0) and (6, 0)

40 The graph of which function appears to have 2 and -3 as zeros?



41 What is the tenth term in this geometric sequence?

$$0.2, 1, 5, 25, 125, \dots$$

- A 78,125
B 390,625
C 1,953,125
D 9,765,625

42 What is the solution set for the following system of equations?

$$\begin{cases} y = x^2 - 2x + 1 \\ y = 3 - x \end{cases}$$

F $\{(0, 3), (1, 2)\}$ H $\{(-2, 5), (1, 2)\}$

G $\{(-2, -5), (-1, 4)\}$ J $\{(-1, 4), (2, 1)\}$

43 Which statement represents the End Behavior of the function

$$f(x) = \frac{2x-1}{x+1} \text{ as } x \text{ approaches}$$

infinity?

A y approaches infinity

B y approaches 2

C y approaches 0

D y approaches 1

44 If digits can be repeated, how many 4-digit numbers can be made using the digits

1, 3, 5, 7, 9 ?

F 20

G 120

H 240

J 625

45 Mrs. Jones's Algebra class has 12 boys and 13 girls. How many choices does she have to form a group of 3 girls and 3 boys to compete in a city-wide Math Contest?

A 156

B 3650

C 62,920

D 2,265,120

46 If the mean of a set of data is 5.5 and the Standard deviation is 2.5, what is the z-score for a value of 6?

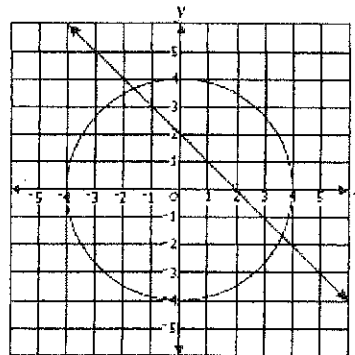
F -.20

G .20

H .30

J -.30

47



Which is the apparent solution set for the system of equations shown on the graph?

A $\{(0, 2), (2, 0)\}$

B $\{(-4, 0), (0, -4), (0, 4), (4, 0)\}$

C $\{(-1.6, 3.6), (3.6, -1.6)\}$

D $\{(-4, 0), (-1.6, 3.6), (0, -4), (3.6, -1.6), (4, 0)\}$

48 What is the solution to the following system of equations?

$$\begin{cases} x^2 + y^2 = 5 \\ x + y = 1 \end{cases}$$

- F $\{(1,-2),(1,2)\}$
- G $\{(-2,1),(2,1)\}$
- H $\{(-1,-2),(1,2)\}$
- J $\{(-1,2),(2,-1)\}$

49 Suppose the weight of year old female bears of a certain species is normally distributed with a mean of 66 pounds and a standard deviation of 8 pounds. What per cent of these bears weigh MORE than 58 pounds?

- A 16%
- B 25%
- C 54%
- D 84%

50 A normally distributed set of 968 values has a mean of 108 and a standard deviation of 11. Which is closest to the number of values expected to Be ABOVE 119?

- F 59
- G 110
- H 154
- J 872

NAME: _____

DATE: _____

**SOL Practice Test (2010):
ALGEBRA 2**

2

Multiple Choice: Identify the choice that best completes the statement or answers the question.

- 1) For non-zero denominators, which of the following is equivalent to $\frac{3a^3 - 75a}{a(a+5)(a+5)}$?

A -3

B $-\frac{1}{a^2}$

C $\frac{(a-5)}{(a+5)}$

D $\frac{3(a-5)}{(a+5)}$

- 2) What is the factored form of $x^2 - 36z^2$?

F $(x + 6z)(x - 6z)$

G $(x + z)(x - 36z)$

H $(x + 6z)^2$

J $(x - 6z)^2$

- 3) Which of these is equivalent to 1 ?

A i^{24}

B i^{12}

C i^{66}

D i^{82}

- 4) Which complex number is equivalent to $(7 - 9i) - (-1 + 3i)$?

F $6 - 6i$

G $6 - 12i$

H $8 - 6i$

J $8 - 12i$

- 5) What is the simplified form of $\sqrt{6} \cdot \sqrt{21}$?

A $3\sqrt{14}$

B $14\sqrt{3}$

C 21

D 63

- 6) How many permutations can be made using all of the letters in the word GENESIS ?

F 210

G 840

H 1260

J 5040

7) Which expression is equivalent to $\sqrt[5]{32x^{10}y^2}$?

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

B $2x^5y^{-3}$

C $\frac{32}{5}x^{\frac{1}{2}}y^{\frac{5}{2}}$

D $\frac{32}{5}x^{50}y^{10}$

8) Which is equivalent to $13 - \sqrt{-81}$?

F 4

G $13 - 9i$

H $13 + 9i$

J 22

9) Use your standard normal bell curve to find the following area under the curve:

$$P(\mu - \sigma \leq x \leq 2\sigma)$$

A 68%

B 95%

C 81.5%

D 99%

10) Which expression is equivalent to

$$\frac{\frac{2x^8}{5y}}{\frac{4x^2}{25y^3}}, \text{ where } x \neq 0 \text{ and } y \neq 0 ?$$

F $\frac{2x^8}{4x^2} \cdot \frac{5y}{25y^3}$

G $\frac{2x^8}{5y} \cdot \frac{25y^3}{4x^2}$

H $\frac{2x^8}{5y} \cdot \frac{4x^2}{25y^3}$

J $\frac{4x^2}{25y^3} \cdot \frac{5y}{2x^8}$

11) Using $a_n = a_1r^{n-1}$, what is the 10th term in this geometric sequence?

$$0.2, 1, 5, 25, 125, \dots$$

A 78,125

B 390,625

C 1,953,125

D 9,765,625

12) If $f(x) = 2x^2 - 7x$, what is the value of $f(-4)$?

F -44

G -4

H 60

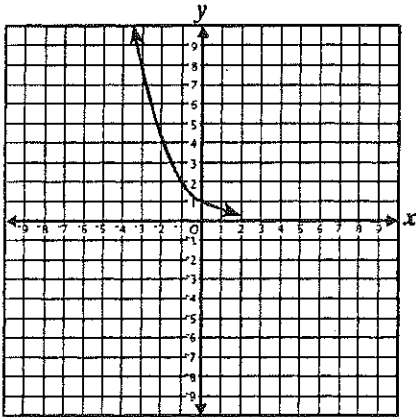
J 92

13) Given: $f(x) = (x - 4)^2 - 1$

What is the vertex of the graph for this function?

- A (-4, -1)
- B (-4, 1)
- C (4, -1)
- D (4, 1)

14) The graph shown *most* accurately represents which of the following functions?



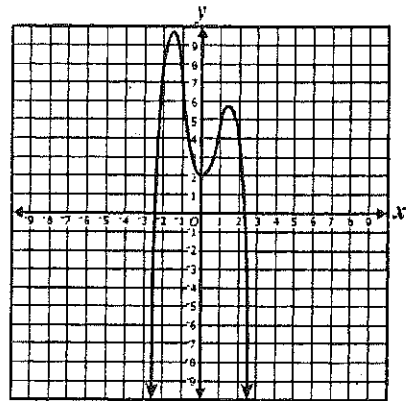
- F $f(x) = -\left(\frac{1}{2}\right)^x$
- G $f(x) = \left(\frac{1}{2}\right)^x$
- H $f(x) = -2^x$
- J $f(x) = 2^x$

15) Given: $S_n = \frac{1}{2}n[2a_1 + (n - 1)d]$

An outdoor theater has 37 seats in the first row, 40 seats in the second row, and 43 seats in the third row. If this pattern continues, what is the total number of seats in the first 10 rows?

- A 120
- B 320
- C 505
- D 520

16) The graph of a 4th-degree polynomial is shown.



Exactly how many real zeros does this function have?

- F 1
- G 2
- H 3
- J 4

17) What is the value of $\sum_{n=1}^3 (17n - 15)$?

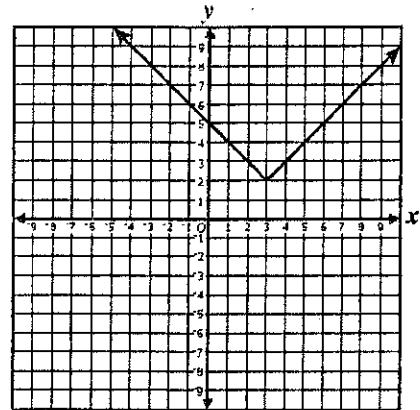
- A 2
- B 19
- C 36
- D 57

- 18) Which of the following equations *best* models the data in this table?

x	y
-2	5
-0.5	2
0	1
1.5	0.5
2.5	1.5
3	2.5

- F $y = 2\left(\frac{4}{5}\right)^x$
- G $y = x^2 + 1$
- H $y = \frac{3}{4}x + 2$
- J $y = \frac{1}{2}x^2 - x + 1$
- 19) The time it takes to do a job is inversely proportional to the number of workers. If 8 workers can do a job in 6 days, then 16 workers can do the same job in –
- A 1.5 days
- B 3 days
- C 6 days
- D 12 days
- 20) What type of function is $y = 2^x + 8$?
- F Exponential
- G Quadratic
- H Linear
- J Step

- 21) The graph *most* accurately represents which of the following functions?



- A $y = |x + 3| + 2$
- B $y = |x - 3| + 2$
- C $y = |x - 2| + 3$
- D $y = |x + 2| + 3$
- 22) The graph of $y = 4x - 11$ is translated up 8 units. Which equation represents the translated graph?
- F $y = 4x - 19$
- G $y = 12x - 3$
- H $y = 12x - 11$
- J $y = 4x - 3$
- 23) Which equation represents the statement “ r is inversely proportional to s and directly proportional to the cube of t ” ?
- A $r = \frac{kt^3}{s^3}$
- B $r = \frac{k}{st^3}$
- C $r = \frac{ks}{t^3}$
- D $r = \frac{kt^3}{s}$

- 24) Which equation *best* represents the data in this table?

x	y
0.5	-0.75
1	0
1.5	0.5
2	0.75
3	1

F $y = \ln x$

G $y = \frac{1}{2}x$

H $y = -\frac{1}{2}x^2 + 2x - 1$

J $y = \sqrt{x+1}$

- 25) Given $f(x) = -3x + 4$ and $g(x) = x + 7$, what is the value of $g(f(2))$?

A -23

B -18

C 5

D 7

- 26) Which lists four consecutive terms of an arithmetic sequence?

F 3, 10, 17, 24

G 1, 4, 9, 16

H 1, 2, 4, 8

J -5, 6, 10, 13

- 27) What are all the roots for the equation $3|w - 14| - 6 = 21$?

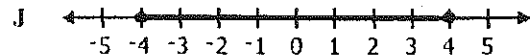
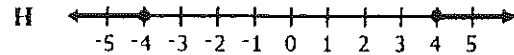
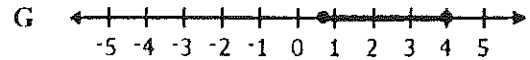
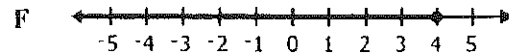
A 19

B 23

C 5 and 23

D 9 and 19

- 28) Which graph *best* represents the solutions to the inequality $|3x - 7| \leq 5$?



- 29) What is the solution set for

$$\sqrt{k+64} - 8 = -2$$

A $\{-28\}$

B $\{-124\}$

C $\{4\}$

D $\{\}$

- 30) What is the solution set of the equation

$$x^2 - 2x + 5 = 0$$

F $\{-3, 1\}$

G $\{-1, 3\}$

H $\{1 - 2i, 1 + 2i\}$

J $\{-1 - 2i, -1 + 2i\}$

- 31) What is the solution to $\sqrt[3]{x-4} = -5$?

A $x = -121$

B $x = -1$

C $x = 29$

D $x = 129$

32) Which is the solution set for $(x + 5)^2 = 0$?

- F {25}
- G {5}
- H {-5}
- J {-5, 5}

33) What is the solution set for $\frac{5}{3} - \frac{2}{x} = \frac{8}{x}$ if $x \neq 0$?

- A {2}
- B $\left\{\frac{18}{5}\right\}$
- C $\left\{\frac{26}{5}\right\}$
- D {6}

34) Which of the following represent the solutions to $|4x + 9| > 11$?

- F $x < -5$ or $x > \frac{1}{2}$
- G $-5 < x < \frac{1}{2}$
- H $x < -\frac{1}{2}$ or $x > 5$
- J $-\frac{1}{2} < x < 5$

35) What is the solution set of $\sqrt{2x + 7} = 6$?

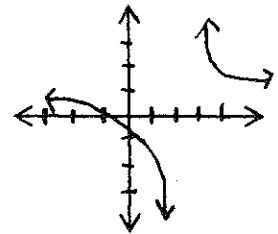
- A $\left\{\frac{5}{2}\right\}$
- B $\left\{\frac{19}{2}\right\}$
- C $\left\{\frac{29}{2}\right\}$
- D $\left\{\frac{43}{2}\right\}$

36) What is the solution set of $2x^2 + 7x + 5 = 0$?

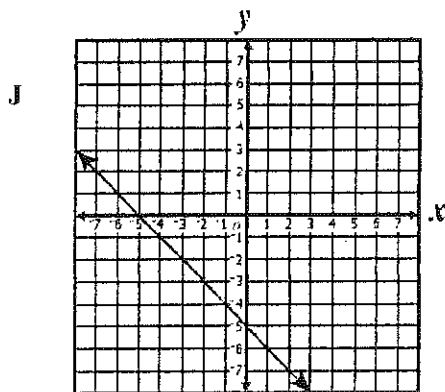
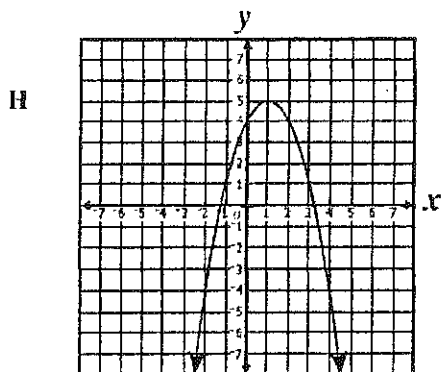
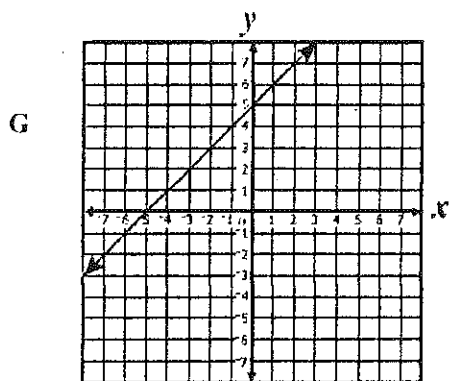
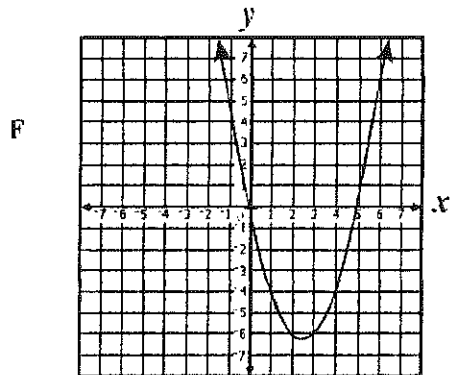
- F $\left\{-5, -\frac{1}{2}\right\}$
- G $\left\{-\frac{5}{2}, -1\right\}$
- H $\left\{1, \frac{5}{2}\right\}$
- J $\left\{\frac{1}{2}, 5\right\}$

37) Which function represents this graph?

- F $f(x) = \frac{8}{x+3}$
- G $f(x) = \frac{8}{x-3}$
- H $f(x) = \frac{x+1}{x+3}$
- J $f(x) = \frac{x+1}{x-3}$



38) Which graph *most* likely represents a function with a zero of 5?



39) Which is a zero of the function $f(x) = (x + 3)(2x - 1)(x + 2)$?

- A 3
- B 0
- C -1
- D -2

40) What are the coordinates of the vertex of the graph of the function $-2(x - 1)^2 = y + 5$?

- F (-1, 5)
- G (2, 5)
- H (1, -5)
- J (-2, -5)

41) A polynomial function has a zero at $x = 3$. Which of the following expressions *must* be one factor of the polynomial?

- A $(x - 3)$
- B $(x + 3)$
- C $3x$
- D x^3

42) Where does the graph of $f(x) = (3x - 5)(x + 9)$ cross the x -axis?

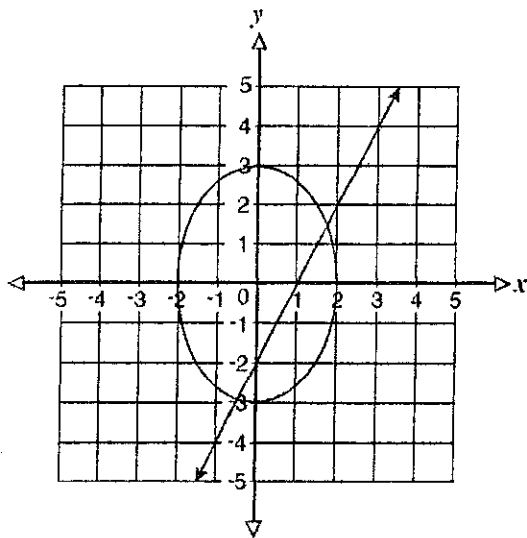
- F $\left(\frac{5}{3}, 0\right)$ and $(-9, 0)$
- G $\left(\frac{5}{3}, 0\right)$ and $(-3, 0)$
- H $\left(-\frac{5}{3}, 0\right)$ and $(9, 0)$
- J $\left(-\frac{5}{3}, 0\right)$ and $(-45, 0)$

- 43) What is the solution set for the equation below?

$$\frac{x}{x-1} + \frac{x}{2} = \frac{1}{1-x}$$

- A $\{-1\}$
- B $\{2\}$
- C $\{0,2\}$
- D $\{1,2\}$

44)



Apparently, the system of equations graphed above has –

- F exactly 1 solution
- G exactly 2 solutions
- H exactly 3 solutions
- J no solutions

- 45) Which statement represents the

End Behavior of the function

$$f(x) = \frac{x-1}{x+1} \text{ as } x \text{ approaches}$$

infinity?

- A y approaches infinity
- B y approaches 1
- C y approaches 0
- D y approaches -1

- 46) Which of the following statements describes the solutions for the

$$\text{equation } 9x^2 - 12x + 4 = 0?$$

- F All real numbers
- G Two distinct real solutions
- H Only one distinct real solution
- J Two complex solutions

- 47) What is the solution set for the following system of equations?

$$\begin{cases} x^2 + y^2 = 5 \\ x + y = 1 \end{cases}$$

- A $\{(1, -2), (1, 2)\}$
- B $\{(-2, 1), (2, 1)\}$
- C $\{(-1, -2), (1, 2)\}$
- D $\{(-1, 2), (2, -1)\}$

48) If digits cannot be repeated, how many 4-digit numbers can be made using the digits

1, 3, 5, 7, 9 ?

F 60

G 120

H 240

J 625

49) Suppose the weight of year old female bears of a certain species is normally distributed with a mean of 66 pounds and a standard deviation of 8 pounds. What per cent of these bears weigh less than 58 pounds?

A 16%

B 25%

C 34%

D 45%

50) A normally distributed set of 968 values has a mean of 108 and a standard deviation of 11. Which is closest to the number of values expected to be ABOVE 125?

F 59

G 210

H 500

J 910

SOL Practice Test #3

Technology Enhanced Questions

A. Put your answer in the box. These are open-ended questions. Work them out and you will type your answer into the box on your computer. For our purposes, you will just write your answer in the box.

1. The earned-run-average for a baseball pitcher varies directly with the number of earned runs and inversely with the number of innings pitched.

- The ERA for a pitcher allowing 45 runs in 108 innings is 3.75
- Sam is a pitcher. He allowed 112 runs and had an ERA of 4.50. How many innings did he pitch?

TYPE YOUR ANSWER INTO THE BOX BELOW

.....

2. Mrs. Jones has 15 students in her Algebra Trig class. Mrs. Smith has 22 students in her Algebra Trig class. They want to set up a competition between the two classes. If Mrs. Jones picks a group of 4 students for her team, and Mrs. Smith picks a group of 4 students for her team, how many more choices does Mrs. Smith have for her teams compared to Mrs. Jones?

.....

3. Which of the following is equivalent to $\frac{5}{4+i}$?

.....

4. In how many ways can you arrange 4 pictures on the wall if you are using all 4 pictures?

.....

5. The following sequence is given in recursive form:

$$\begin{cases} a_1 = 8 \\ a_n = 2a_{n-1} + 5 \end{cases}$$

What is the value of the fifth term?

6. The mean of a data set is 163 and the standard deviation is 5. What percent of the data is between 148 and 158?

B. Click & Drag. These questions give you choices for your answer or answers. You must click on each answer and drag it to the appropriate box. You must get all of them correct to get the answer correct. For our purposes, just place the correct answers in the boxes.

7. What are the Vertical and Horizontal asymptotes for $c(x) = \frac{2x+4}{x-1}$. Click and Drag Choices.

Vertical

Horizontal

You just choose and place in box.

$x = 2$ $x = 4$ $x = 1$ $x = -1$

$y = 0$ $y = 2$ $y = 1$ $y = -2$

8. Which represents the zero of the function $g(x) = \frac{2x-1}{x+1}$?

Zero

$(0, -1)$ $(-1, 0)$ $(1/2, 0)$ $(-1/2, 0)$ $(0, 1/2)$

C. Hi-light each correct answer. These questions also give you choices. You must click on each correct answer and make sure you mark every answer that is correct. If you forget one, it will be incorrect. For our purpose, just place a check beside every correct answer.

9. Indicate the intervals where the graph of

$$F(x) = 2x^3 - 3x^2 - 12x + 20 \text{ is increasing.}$$

PUT A CHECK BESIDE EACH CORRECT ANSWER FOR TODAY.

$-\infty < x < \infty$

$-\infty < x < -1$

$-2.5 < x < \infty$

$-1 < x < 2$

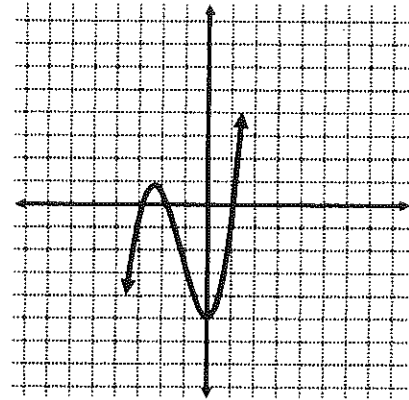
$0 < x < \infty$

$2 < x < \infty$

10. Which of the following are factors of $f(x)$? Choose all that apply.

$x-2$ $x+2$ $x-3$ $x+3$

$x+1$ $x-1$ $x-5$ $x+5$



11. Identify each function with the same range as $f(x) = |x| - 4$.

Put a check beside each function.

$g(x) = x^2 + 2x - 3$

$h(x) = x^3 - 4$

$j(x) = 2^x - 5$

$k(x) = \sqrt{x} - 4$

$m(x) = (x - 4)^2$

12. The graph of $h(x) = \frac{2x-1}{x}$ has which of the following intercepts? Circle all of your answers.

1 x-intercept 1 y-intercept 2 x-intercepts 2 y-intercepts no x-intercepts no y-intercepts

