LESSON 89 Midterm Exam Practice Test

This is a practice test for your midterm exam. It is usually a good practice to take a practice test just like a real exam. Read the directions in Lesson 90. When you are ready, begin the test.

1. $3x + 5 = 2(x - 3) + 7$

If x is the solution to the equation above, what is the value of $5 - x$?

2. $5(x - 1) + 3x = kx + 1$

For what value of k does the equation have no solution?

3. $|2x - 1| - 4 < 1$

What is the largest integer value that makes the inequality above true?

4. The sum of four consecutive even integers is 92. What is the greatest of the integers?

5. Line m passes through $(2, 0)$ and $(6, 1)$. Line n is perpendicular to line m and passes through $(-1, 7)$. Write an equation for line n in slope-intercept form.

6. A gym membership costs $\$50$ to join and $\$35$ each month. Carol joined the gym and also rented a locker at $\$11$ per month. Which equation represents the total cost, y, after x months?

A) $y = 50 + 35x + 11$

B) $y = 50 + 35 + 11x$

C) $y = 50 + (35 + 11)x$

D) $y = (50 + 35 + 11)x$

7. $x + 4y = 3$

$3x - 2y = 2$

If (x, y) satisfies the system of equations above, what is the value of $x + 2y$?

8. $2x - 3y = a$

$4x + by = 2$

If the system of equations above has infinitely many solutions, what is the value of $a - b$?

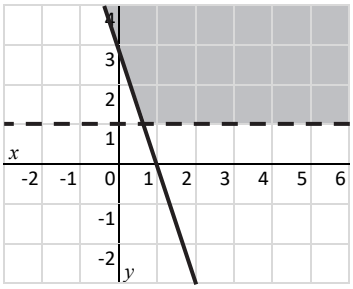
9. A bakery sells cupcakes at $\$4$ each and donuts at $\$2$ each. If Jose spent $\$50$ buying a total of 20 cupcakes and donuts, how many cupcakes did he purchase?

10. $x + y \leq 3$

$x + 2y \geq 2$

Which quadrant does NOT contain any solutions to the system of inequalities above?

11. Which system of inequalities is graphed below?



A) $y > 1$
$3x + y \leq 3$

B) $y > 1$
$x + 3y \leq 3$

C) $y > 1$
$3x + y \geq 3$

D) $y > 1$
$x + 3y \geq 3$

12. A music club is selling tickets to its concert. Student tickets cost $\$5$ each and adult tickets cost $\$10$ each. The auditorium can hold a maximum of 80 people. The club must make at least $\$500$ from ticket sales to cover the costs. Write a system of inequalities that models this situation.

13. $x(2x-1)^2 - (x+3)(x-3)$

If the expression above is written in the form $ax^3 + bx^2 + cx + d$, what is the value of $a + b + c + d$?

14. $\dfrac{6x^2 + 7x - 8}{2x + 3} = 3x - 1 + \dfrac{R}{2x + 3}$

In the equation above, what is the value of R ?

15. Let $p(x) = 2x^3 - 5x^2 + x + 2$. Which statement is true about $p(x)$. Select all that apply.

A) $x - 1$ is a factor of $p(x)$.

B) $x + 2$ is a factor of $p(x)$.

C) When $p(x)$ is divided by $x + 1$, the remainder is 6.

D) When $p(x)$ is divided by $x - 3$, the remainder is 14.

16. $f(x) = 3x - 1$

$g(x) = x^2 + 3x + 4$

Given the functions above, what is the value of $(f - g)(-1)$?

17. $f(x) = \dfrac{1}{2}x + \dfrac{3}{2}$

What is the inverse function f^{-1} of the function above?

18. $f(x) = \begin{cases} -x+3 & if\ x < 3 \\ x-3 & if\ x \geq 3 \end{cases}$

Which statement is true about the function above? Select all that apply.

A) The range is $[0, \infty)$.

B) The function is an even function.

C) The average rate of change over the interval $[0,3]$ is -1.

D) The graph is the same as the graph of $y = |x|$ shifted left 3 units.

E) The end behavior is the same as that of the graph of $y = x^2$.

19. $(2+i)(1-2i) + (2i)(3i) - i^3$

If the expression above is written in the form $a + bi$, what is the value of ab ?

20. $2x^2 - 7x + 3 = 0$

If m and n are two solutions of the equation above and $m > n$, what is the value of $m - 4n$?

21. $x^2 - 4x + 6 = 0$

What are the sum and product of the solutions of the equation above?

A) sum = 4, product = 6

B) sum = 4, product = -6

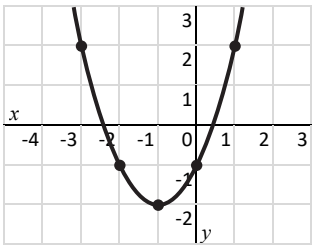
C) sum = -4, product = 6

D) sum = -4, product = -6

22. $kx^2 + 8x + 2 = 0$

For what values of k does the equation above have exactly one solution?

23. The graph of the quadratic function $f(x)$ is shown below. Write $f(x)$ in vertex form.



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

The graph of the function above intersects the x-axis at $(p, 0)$ and $(q, 0)$. What is the value of $p + q$?

25. The graph of $f(x)$ is the graph of $y = x^2$ reflected over the x-axis and shifted left 2 units and down 1 unit. Write $f(x)$ in standard form.

26. $x^2 - 6x + 5 < 0$

What is the smallest integer value that makes the inequality above true?

27. $h(t) = -16t^2 + 32t + 20$

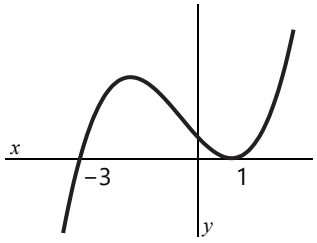
A ball is thrown straight up from a height of 20 feet with an initial speed of 32 feet per second. The function above gives its height h, in feet, after t seconds. What is the maximum height reached by the ball?

28. $x^3 - x^2 - 2x + 2 = 0$

What is the sum of the solutions to the equation above?

29. Write a polynomial equation of least degree in standard form whose leading coefficient is 1 and whose solutions are -2, $\sqrt{3}$, and $-\sqrt{3}$.

30. Which function could be graphed below?



A) $f(x) = (x - 1)(x + 3)^2$

B) $f(x) = (x - 1)^2(x + 3)$

C) $f(x) = (x + 1)(x - 3)^2$

D) $f(x) = (x + 1)^2(x - 3)$

STOP

This is the end of the test.
Review your answers before grading.