DEPARTMENT FINAL EXAMINATION
## MATH 115—FALL08
VERSION 3   TEST#____

# DO NOT WRITE ON EXAM

1. Victor correctly answered 38 questions on a 40 question math test. Which percent did Victor get correct?

   [A] 45%   [B] 61%   [C] 95%   [D] 46%

2. Solve. $5 = 3(x - 2) + 3 - 2x$ [A] 10   [B] 14   [C] 4   [D] 8

3. Lawn ornaments may be rented at a rate determined by the formula $C = 2.9n + 1.7$, where C is the cost in dollars and n is the number of ornaments. Find the cost of renting 18 horse ornaments for a party.

   [A] $53.90   [B] $50.50   [C] $52.20   [D] $57.13

4. A stamp collector has 8¢ stamps and 15¢ stamps. The number of 8¢ stamps is six less than four times the number of 15¢ stamps. The total value of the stamps is $1.40. Find the number of both types of stamps in the collection.

   [A] 8¢ stamps: 10; 15¢ stamps: 4   [B] 8¢ stamps: 10; 15¢ stamps: 3

   [C] 8¢ stamps: 22; 15¢ stamps: 4   [D] 8¢ stamps: 4; 15¢ stamps: 10

5. An investor placed a total of $20,000 in two simple interest accounts. One account earned a simple interest rate of 5.9%, and the other earned a simple interest rate of 4.6%. The two accounts earned a total of $946. How much was invested in each account?

   [A] $2000 at 5.9%; $18,000 at 4.6%   [B] $8852 at 5.9%; $11,148 at 4.6%

   [C] $8671.81 at 5.9%; $11,328.19 at 4.6%   [D] $18,000 at 5.9%; $2000 at 4.6%

6. How much pure water must be mixed with 6 pints of 70% developer to produce a mixture that is 40% developer?

   [A] $4\frac{13}{20}$ pt   [B] $4\frac{1}{2}$ pt   [C] $10\frac{1}{2}$ pt   [D] $10\frac{7}{20}$ pt

7. Solve. $x - 4 + (x + 6) > 0$ [A] $x > -1$ [B] $x < -1$ [C] $x > 1$ [D] $x < 1$

8. A plane flies 900 miles, with a tail wind, in 3 hours. It takes the same plane 4 hours to fly the 900 miles when flying against the wind. What is the plane's speed in still air?

   [A] 262.5 mph   [B] 300 mph   [C] 281 mph   [D] 37.5 mph
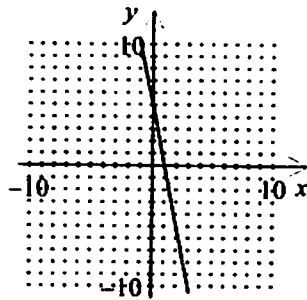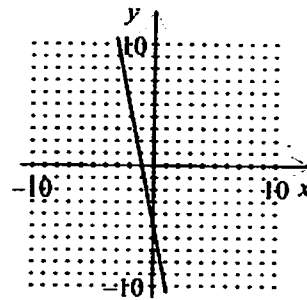
9. Which is the graph of $y = 5x - 5$?

[A]
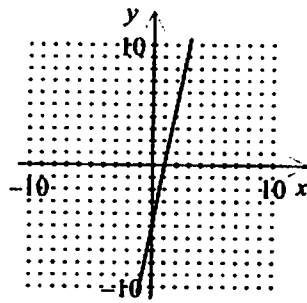
[B]
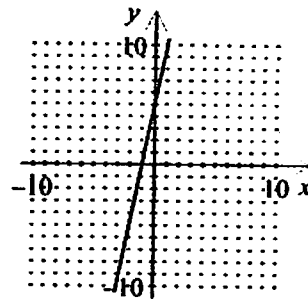
[C]

[D]

10. Find the slope of the line that contains $(8, 6)$ and $(6, -5)$.

[A] $\dfrac{1}{14}$ [B] 14   [C] $\dfrac{11}{2}$ [D] $\dfrac{2}{11}$

11. Which shows the equation of a line, in slope-intercept form, that passes through the point $(-5, -3)$ and has slope 3?
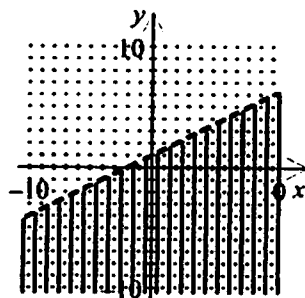
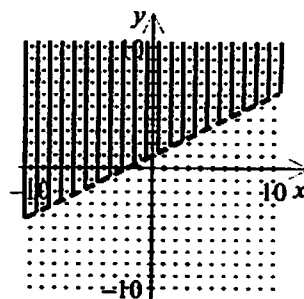[A] $y = 3x + 12$ [B] $y = -3x + 12$ [C] $y = -3x - 12$ [D] $y = 3x - 12$
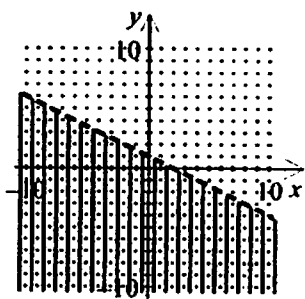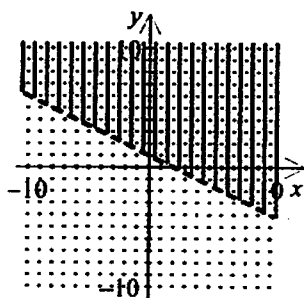
12. Graph. $x + 2y > 2$

[A]

[B]

[C]

[D]

13. Solve by the addition method. $4x + 3y = 10$
$x - 3y = 10$

[A] $(26, -2)$ [B] $(4, -2)$ [C] $\left(0, \dfrac{10}{3}\right)$ [D] no solution

14. Solve by substitution. $y = x - 2$
$y = 2x$

[A] $(1, -1)$ [B] $(-1, -2)$ [C] $(2, 1)$ [D] $(-2, -4)$

15. A clothing manufacturer purchased 60 yards of cotton and 90 yards of wool for a total of $1800. Another purchase, at the same prices, included 80 yards of cotton and 20 yards of wool for a total cost of $1000. Find the cost per yard of the cotton.

[A] $14 per yard   [B] $10 per yard   [C] $9 per yard   [D] $16 per yard

Simplify.

16. $\left(8x^3 + 9x - 7\right) - \left(3x^3 + 7x - 9\right)$

[A] $11x^3 + 2x + 2$ [B] $5x^6 + 2x^2 + 2$ [C] $11x^3 + 16x - 16$ [D] $5x^3 + 2x + 2$

17. $\left(-4t^3n^2p\right)^4$

[A] $-16t^7n^6p^5$ [B] $256t^{12}n^8p^4$ [C] $-16t^{12}n^9p^4$ [D] $256t^7n^8p^5$

18. $(5h + 7)(4h - 9)$

[A] $20h^2 - 73h - 63$ [B] $20h^2 + 18h - 62$ [C] $20h^2 - 17h - 62$ [D] $20h^2 - 17h - 63$

19. $(5x - 4y)^2$

[A] $25x^2 + 16y^2$ [B] $25x^2 + 2xy + 16y^2$ [C] $25x^2 - 20xy + 16y^2$ [D] $25x^2 - 40xy + 16y^2$

20. Express the number in scientific notation. 5,400,000

[A] 54×10^5 [B] 5.4×10^6 [C] 54×10^7 [D] 5.4×10^8

Simplify.

21. $\dfrac{4xy^3 + 8x^2y + 2x^2y^2}{2xy}$

   [A] $2y^2 + 8x^2y + 1$ [B] $2y^2 + 8x^2y + 2xy$ [C] $2y^2 + 4x + xy$ [D] $2y^2 + 4x + 1$

22. $\dfrac{2a^2 - a + 3}{a - 1}$

   [A] $2a + 1, r\, 4$ [B] $3a + 1, r\, -2$ [C] $3a - 1, r\, -4$ [D] $2a - 3, r\, 2$

23. $\dfrac{35x^7y^2}{-7x^5y^6}$ [A] $\dfrac{5x^2}{y^4}$ [B] $-\dfrac{x^2}{5y^4}$ [C] $-\dfrac{5x^{12}}{y^8}$ [D] $-\dfrac{5x^2}{y^4}$

Factor.

24. $12x^4y + 12x^3y^2 - 9x^2y^3$

   [A] $3x^2y(2x + 3y)(2x - y)$ [B] $3x^2y(4x^2 + 4y + 3y^2)$

   [C] $3x^2y(2x + y)(2x - 3y)$ [D] $3x^2y(4x^2 + 4y - 3y^2)$

25. $x^2 - 121$

   [A] $(x + 11)(x + 11)$ [B] $(x + 11)(x - 11)$ [C] $(x - 11)(x - 11)$ [D] $(x + 11)(x - 9)$

26. Solve by factoring. $12x^2 + 25x + 12 = 0$

   [A] $-\dfrac{3}{4},\ \dfrac{4}{3}$ [B] $\dfrac{3}{4},\ \dfrac{4}{3}$ [C] $\dfrac{3}{4},\ -\dfrac{4}{3}$ [D] $-\dfrac{3}{4},\ -\dfrac{4}{3}$

27. The length of a rectangle is 2 cm less than twice the width. The area of the rectangle is 180 cm². Find the length of the rectangle.

   [A] 10 cm   [B] 15 cm   [C] 18 cm   [D] 12 cm

Simplify.

28. $\dfrac{x^2 - 6x - 16}{x^2 - 4}$ [A] $\dfrac{x + 8}{x - 2}$ [B] $\dfrac{x - 8}{x + 2}$ [C] $\dfrac{x + 8}{x + 2}$ [D] $\dfrac{x - 8}{x - 2}$

29. $\dfrac{x^2}{x - 9} \cdot \dfrac{x^2 - 7x - 18}{x^2 + 2x}$ [A] x [B] $\dfrac{x^2 + 2x}{x + 2}$ [C] $\dfrac{x^2 - 2x}{x + 2}$ [D] $\dfrac{-7x - 18}{-18x}$

30. $\dfrac{4}{x + 9} + \dfrac{3}{x - 9}$ [A] $\dfrac{7x - 9}{x^2 - 81}$ [B] $\dfrac{7}{x^2 - 81}$ [C] $\dfrac{7}{x + 9}$ [D] $\dfrac{7x - 9}{7}$

Simplify the complex fraction.

31. $\dfrac{\dfrac{x^2-10x+25}{-12x}}{\dfrac{x-5}{-6x}}$ [A] $\dfrac{x+25}{2x}$ [B] $-9x-5$ [C] $\dfrac{x+5}{2}$ [D] $\dfrac{x-5}{2}$

32. Solve the equation. $\dfrac{x}{x^2-81}+\dfrac{9}{x-9}=\dfrac{1}{x+9}$ [A] 10   [B] 8   [C] -10 [D] -8

33. The ratio of graduate students to undergraduates at a certain university is 2 to 5. If there are 2730 graduate students at the university, how many undergraduates are there?

   [A] 6825   [B] 19,110   [C] 9555   [D] 13,650

34. Solve the formula for the given variable. $y=mx+b$ for x

   [A] $x=\dfrac{y}{m}-b$ [B] $x=\dfrac{y+b}{m}$ [C] $x=\dfrac{y}{m+b}$ [D] $x=\dfrac{y-b}{m}$

Simplify.

35. $\sqrt{8x^{11}y^4}$ [A] $2xy^2\sqrt{8x}$ [B] $x\sqrt{2x}$ [C] $4x^{10}y^2\sqrt{2xy}$ [D] $2x^5y^2\sqrt{2x}$

36. $x+5\sqrt{x}-2\sqrt{x}-6$

   [A] $x+3\sqrt{x}-6$ [B] $10x^2-6$ [C] $x+7\sqrt{x}-6$ [D] $-10x^2-6$

37. Solve. $\sqrt{x+23}=x+11$ [A] -7 [B] -14 [C] $-14,\ -7$ [D] no solution

38. Solve using the quadratic formula. $3x^2+6x-4=0$

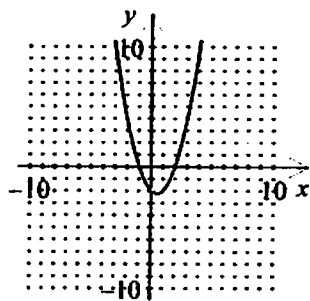   [A] $\dfrac{-3+\sqrt{21}}{3},\ \dfrac{-3-\sqrt{21}}{3}$ [B] $\dfrac{3+\sqrt{21}}{3},\ \dfrac{3-\sqrt{21}}{3}$

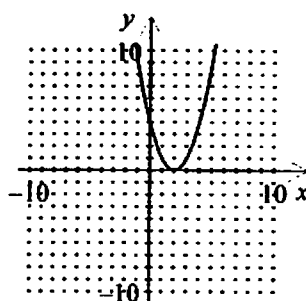   [C] $\dfrac{-3+2\sqrt{21}}{3},\ \dfrac{-3-2\sqrt{21}}{3}$ [D] $\dfrac{3+2\sqrt{21}}{3},\ \dfrac{3-2\sqrt{21}}{3}$

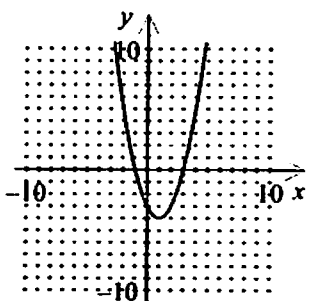39. Graph. $y = x^2 - 4x + 4$

[A]

[B]

[C]

[D] none of these

40. One solar heating panel can raise the temperature of water 1 degree in 30 minutes. A second solar heating panel can raise the temperature 1 degree in 45 minutes. How long would it take to raise the temperature of water one degree with both solar panels operating?

[A] 10 minutes   [B] 15 minutes   [C] 18 minutes   [D] 12 minutes