

## Merten Hasse Test – 2004– Division III (Algebra II)

- Find an equation of a line passing through the point  $(2, 3)$  and parallel to the line with the equation  $-x + 2y = 1$ .
  - $y = -2x + 3$
  - $y = \frac{1}{2}x + 2$
  - $y = -x + 1$
  - None of the previous
- Factor completely  $a^2(a - 5) + 3a(a - 5) - 4(a - 5)$ . Of the following, which is **not** a factor?
  - $a + 4$
  - $a - 3$
  - $a - 5$
  - None of the previous
- Combine  $6\sqrt{75xy^3} - 8y\sqrt{12xy}$  where  $x, y > 0$ .
  - $-2y\sqrt{63xy}$
  - $14y\sqrt{xy}$
  - $3xy\sqrt{14xy}$
  - None of the previous
- Solve for  $b$   $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$ 
  - $b = \frac{c - a}{a}$
  - $b = \frac{ac}{a - c}$
  - $b = \frac{a - c}{ac}$
  - None of the previous
- Find the domain of the function  $f(x) = \frac{-x}{\sqrt{|x| - a}}$ 
  - $-a \leq x \leq a$
  - $x > a$  or  $-x > a$
  - $x \neq a^2$
  - None of the previous
- Find  $f(k - 1)$  for  $f(x) = 3x^2 - 5x + 4$ .
  - $-11k^2 + 3k + 12$
  - $3k^2 - 11k + 12$
  - $3k^2 - 11k + 2$
  - None of the previous
- Find  $(f \circ g)(x)$  for  $f(x) = x^2 + 3$  and  $g(x) = \sqrt{x} - 4$ .
  - $x - 8\sqrt{x} + 19$
  - $x + 19$
  - $\sqrt{x^2 + 3} - 4$
  - None of the previous



15. Add  $\frac{5x}{x+2} + \frac{x-1}{x}$
- a)  $\frac{6x^2 + x - 2}{2x + x^2}$                       b) 2
- c)  $\frac{5x + 1}{x^2 + 2x}$                       d) None of the previous
16. Find the SUM of the solutions to the equation  $\log_2(x+1) + \log_2(x-1) = 3$ .
- a)  $-1, 1$                       b) 3
- c) 2                      d) None of the previous
17. How many solutions does the following system have?  $\begin{cases} y = -5 + 4x \\ 8x = 2y + 10 \end{cases}$ .
- a) None                      b) Exactly one
- c) Infinitely many                      d) None of the previous
18. Find the slope of a line perpendicular to the line given by the equation  $2x - 10y + 8 = 0$ .
- a)  $\frac{1}{5}$                       b)  $-\frac{1}{5}$
- c)  $-5$                       d) none of the above
19. Write a formula for the  $n$ th term of the infinite sequence  $0, 2, 6, 12, 20, \dots$ , provided the pattern continues.
- a)  $a_n = 2n - 2$                       b)  $a_n = 4n - 6$
- c)  $a_n = 2^{n-1} - 1$                       d) None of the previous
20. Solve for  $x$   $\frac{-x}{x+3} = \frac{3}{x+3} + 5$
- a)  $x = -8$                       b)  $x = -3$
- c) no solution                      d) None of the previous
21. Solve  $(x+5)(x^2-9) > 0$ .
- a)  $(-5, -3) \cup (3, \infty)$                       b)  $(-5, \infty)$
- c)  $(-\infty, -3) \cup (3, \infty)$                       d) None of the previous









Answers

1. B :  $y = \frac{1}{2}x + 2$
2. b:  $(a - 3)$
3. d: None of above
4. B:  $\frac{ac}{a - c}$
5. B:  $x > a$  or  $-x > a$
- 6 b:  $3k^2 - 11k + 12$
7. A:  $x - 8\sqrt{x} + 19$
8. c:  $y^2 + x^2 = 9$
9. A:  $f^{-1}(x) = \frac{5x - 7}{3}$
- 10 a:  $-4$
- 11 D:  $-3$
12. b:  $\frac{2}{5}\log(y) - \frac{1}{3}\log(x) - \log(z)$
13. c:  $-4$
14. B:  $1x=-1$
15. a  $\frac{6x^2+x-2}{x^2+2x}$
- 16, b:  $3$
17. C: *Infinitely* many
18. C:  $-5$
- 19: d None of above
20. C: No solution
- 21 a  $(-5, -3) \cup (3, \infty)$
22. b:  $13 < t < 16$
23. c:  $140 + 225i$
24. A:  $9a^2 - 6$
25. B  $x = 2$ , and  $x = -1$
26. B:  $\frac{1}{a}$
27. A:  $a = \ln(c) - b$
28. C:  $R = 10$
- 29: a : \$1626.24
- 30 b:  $r^{15n-12}$
31. c:  $\frac{14}{15} - \frac{7}{15}i$
- 32 C No solution
33. a  $-672$

- 34 c: 12
- 35 a 3
- 36 C distance=10
- 37 B [-1,9]
- 38 A  $\frac{27y}{x}$
- 39 c (-1,7)
- 40 D *None* of the above
- 41 a
- 42 D -8
- 43 A {-3,3}
- 44 B:  $x + 2$
- 45: B.  $x = \pm\sqrt{2}$
- 46: b:  $x \leq -7$  or  $x \geq \frac{5}{3}$
- 47: c: one
- 48 C :  $2x + h + 1$
- 49: a 4
- 50 d none of the above