MATH114 COLLEGE MATH & STATISTICS 100pts TEST 1 FALL 11 p.1 INSTRUCTOR: CARLA MORRIS NAME: Key

In problems 1 & 2 assume A = {1, 3, 4, 7, 8} and B = {3, 4, 5, 7}

3pts 1. {3, 7} ⊂ **B** TRUE or FALSE (circle one)

3pts 2. Find (**A** ∩ **B**) = {3, 4, 7}

3pts 3. $40 \div 4 + 3 \times 5 =$ 25 (10+15)

3pts 4. $-5^2 + 13 =$ -12 (-25+13)

3pts 5. $\frac{6^9}{6^7} =$ $6^2 = 36$

3pts 6. Simplify using positive exponents $\frac{-56x^9}{8x^{-5}} = -7x^{14}$

3pts 7. Write in exponential form: $\sqrt[7]{x^3}$ $x^{3/7}$

3pts 8. Simplify $(x^{4/5})(x^{16/5})$ $x^{20/5} = x^4$

4pts 9. Simplify $\sqrt{3x^7y^5z^{-3}}\sqrt{12x^5y^{13}z^9} = \sqrt{36x^{12}y^{18}z^6} = 6x^6y^9z^3$

3pts 10. Rationalize the denominator $\frac{9}{\sqrt{7x}}$ $\frac{9\sqrt{7x}}{7x}$

3pts 11. Perform the indicated operations and simplify $(8x^8 + 9x^6 + 7x^3 - 5) - (4x^8 - 3x^5 - 2x^3 + 9x)$

$4x^8 + 9x^6 + 3x^5 + 9x^3 - 9x - 5$

3pts 12. Perform the indicated operations and simplify $(7x^6)(5x^6 + 3x^5 - 3x^3 + 2x)$

$35x^{12} + 21x^{11} - 21x^9 + 14x^7$

4pts 13. Use long division to solve $(x^3 + 6x^2 + 12x + 8) \div (x + 2)$

$x^2 + 4x + 4$

$x+2 \;\overline{)\; x^3 + 6x^2 + 12x + 8}$

$x^3 + 2x^2$

$4x^2 + 12x + 8$

$4x^2 + 8x$

$4x + 8$

$4x + 8$

0

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In problems 14-16 factor completely (4pts each)

14. $x^3 + 27$

$(x+3)(x^2-3x+9)$

15. $x^4 - 625$

$(x^2-25)(x^2+25)$

$(x+5)(x-5)(x^2+25)$

16. $20x^9y^6 + 60x^9y^5$

$20x^9y^5(y+3)$

In problems 17-19 perform the indicated operations and simplify (3pts each)

17. $\dfrac{15x^8y^{11}z^3}{5x^{-3}y^5z^4}$

$\dfrac{3x^{11}y^6}{z}$

18. $\dfrac{x^2-64}{x+5} \div \dfrac{x^2+9x+8}{x^2+6x+5}$

$\dfrac{(x-8)(x+8)}{(x+5)} \cdot \dfrac{(x+5)(x+1)}{(x+8)(x+1)}$

$x-8$

19. $\dfrac{x-12}{x^2-25} + \dfrac{3x-8}{x^2-25}$

$\dfrac{4x-20}{x^2-25} = \dfrac{4(x-5)}{(x-5)(x+5)} = \dfrac{4}{x+5}$

In problems 20-21 solve for x (4pts each)

20. $\dfrac{3x}{7} + 2 = \dfrac{x+18}{5}$

$15x + 70 = 7x + 126$

$8x = 56$ $\quad x = 7$

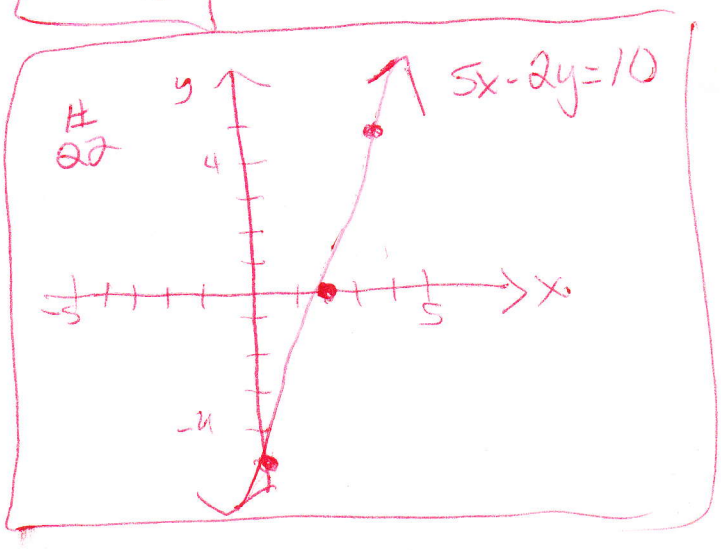
21. $8x - 5 \geq 5x + 13$

$3x \geq 18$

$x \geq 6$

5pts 22. Graph $5x - 2y = 10$

(4,5) (2,0) (0,-5)



3pts 23. If $F(x) = x^2 + 4x + 8$ find F(a)

a^2+4a+8

4pts 24. What is the domain of $y = \dfrac{x-1}{(x+3)(x-4)}$?

$x \neq -3, 4$

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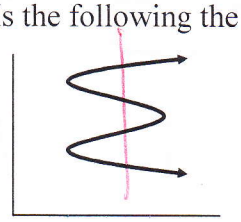
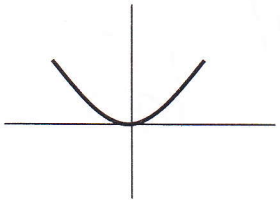
3pts 25. Is the following the graph of a function? why or why not?



No. It fails vertical line test

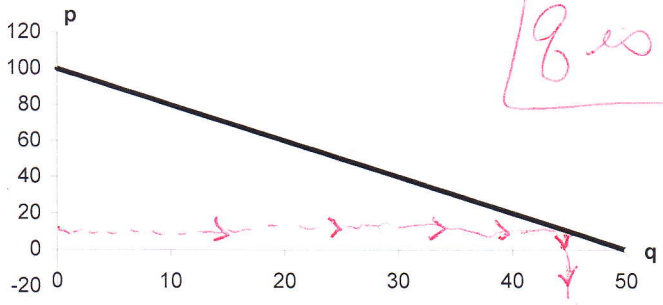
4pts 26.



The graph to the left is the graph of which of the following?

a) x^3 b) x^2 c) x d) $\frac{1}{x}$

3pts 27. Determine how many units q are demanded when the price is 10 in the graph below (mark the graph).



q is about 45

3pts 28. Find the slope of the line through (9, 2) and (13, 10)

$m = \frac{10-2}{13-9} = \frac{8}{4} = 2$

3pts 29. Determine the slope and the y-intercept for $y = 7x - 5$

Slope 7 yinter -5

3pts 30. Find the equation of the line through (8, 3) with slope -5.

$y - 3 = -5(x - 8)$
$y = -5x + 43$

Formulas

$y - y_1 = m(x - x_1)$ $y = mx + b$ $m = \frac{y_2 - y_1}{x_2 - x_1}$

$\sqrt[n]{x^m} = x^{m/n}$ $x^3 - a^3 = (x - a)(x^2 + ax + a^2)$
$x^3 + a^3 = (x + a)(x^2 - ax + a^2)$