Name _____ Date _____ Class _____

Cumulative Test 19A

1. (89) A ball is thrown from a height of 10 feet above the ground. The ball starts with a vertical speed of 64 feet per second. Ignoring friction, the equation $y = -16t^2 + 64t + 10$ gives the height y as a function of time t. Find the highest point the ball reaches and how long it takes to reach this point.

2. (84) Determine whether the equation below represents a quadratic function.

$$y + 2x = 3x^2 + 6$$

3. (83) Determine whether the trinomial below is a perfect-square trinomial. If it is, factor the trinomial.

$$8x^2 - 8x + 2$$

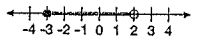
4. (86) Find the midpoint of the line segment with endpoints (6, 1) and (3, –5).

5. (76) Find the product $\left(2 - \sqrt{7}\right)^2$.

6. (78) Identify the asymptotes for the rational function below.

$$y = \frac{3}{x+7} + 2$$

7. (73) Write a compound inequality that describes the graph below.



8. (68) What is the probability of rolling either a sum of 5 or a sum of 8 using two different number cubes, each numbered 1 to 6?

Factor the polynomials in problems 9–10.

9. (79) $3x^3 + 3x^2 - 18x$

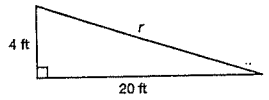
10. (87) $2y^2 - 3y^3 - 9y + 6$

11. (92) It took Lee $\frac{2x^2 - 6x}{2x}$ minutes to drive to a mall that was $\frac{3x - 9}{x^3}$ miles away. Find her rate in miles per minute.

12. (95) Find the least common denominator (LCD) for the expression below.

$$\frac{6}{(x+4)} - \frac{8}{(x^2 + 2x - 8)}$$

13. (85) A ramp extends from a 4-foot high platform to a point on the ground 20 feet away. Find the length r of the ramp in the diagram below. Round your answer to the nearest tenth of a foot.



14. (94) Solve the equation below and graph the solution.

$$\frac{|x|}{6} + 4 = 16$$

Divide problems 15–16.

15. (93) $\left(6x^3 + 3x^2 + 9x\right) \div 3x$

16. (88) $\frac{3m^3n}{2mn^3} + \frac{15m^2n^2}{4m^2n^3}$

17. (90) Add $\frac{3x^3}{2x^2} + \frac{2x}{4x}$. Simplify your answer.

Solve the inequalities in problems 18–20 and graph them on a number line.

18. (81) $\frac{3c}{4} + \frac{3}{8} \le \frac{c}{4} - \frac{5}{8}$

19. (77) $-3(1 - x) \ge 6^2$

20. (91) $|x| < 2$

NAME: Alge 1 Study Guide TEST: 19A

SCORE: _____

1. $y = -16t^2 + 64t + 10$

$x = \frac{-b}{2a}$

$= \frac{-64}{2(-16)}$

$= \frac{-64}{-32} = 2$ sec.

$y = -16(2)^2 + 64(2) + 10$

$= -16(4) + 128 + 10$

$= -64 + 138$

$= 74$

Highest point is 74 feet in 2 sec.

2. $y + 2x = 3x^2 + 6$

$-2x \quad -2x$

$y = 3x^2 - 2x + 6$

* Solve for y
* see if it's $y = x^2$ ....

The equation can be written in the form of $y = ax^2 + bx + c$, so it is quadratic.

3. $8x^2 - 8x + 2$

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

$2((2x)^2 - 2(2x)(1) + (1)^2)$

$2(2x - 1)(2x - 1)$

The trinomial is a perfect square trinomial and factors to $2(2x-1)^2$.

4. $m = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ (6,1)(3,-5)

$m = \left(\frac{6+3}{2}, \frac{1+-5}{2}\right)$

$= \left(\frac{9}{2}, \frac{-4}{2}\right)$

$= \left(4\frac{1}{2}, -2\right)$

5. $(2 - \sqrt{7})^2$

$(2 - \sqrt{7})(2 - \sqrt{7})$

F: $2 \cdot 2 = 4$; O: $2 \cdot -\sqrt{7} = -2\sqrt{7}$; I: $-\sqrt{7} \cdot 2 = -2\sqrt{7}$; L: $-\sqrt{7} \cdot -\sqrt{7} = 7$

$4 + -2\sqrt{7} + -2\sqrt{7} + 7 = 11 - 4\sqrt{7}$

6. $y = \frac{a}{x - b} + c \quad x = b, \; y = c$

$y = \frac{3}{x+7} + 2$

$y = 2$, horizontal asymptote

$x = -7$, vertical asymptote

7. $-3 \le n < 2$

or

$n \ge -3$ and $n < 2$

8.

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

P(Sum of 5 or sum of 8) $\frac{4}{36} + \frac{5}{36} = \frac{9}{36}$

$9\overline{)36} = \frac{1}{4}$

9. $3x^3 + 3x^2 - 18x$

$3x(x^2 + x - 6)$

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

10. $2y^2 - 3y^3 - 9y + 6$

$(2y^2 - 3y^3) + (-9y + 6)$

$y^2(2 - 3y) + 3(-3y + 2)$

$y^2(2 - 3y) + 3(2 - 3y)$

$(2 - 3y)(y^2 + 3)$

1. $d = rt \quad r = \frac{d}{t}$

$r = \frac{\frac{3x-9}{x^3}}{\frac{2x^2-6x}{2x}} = \frac{3x-9}{x^3} \cdot \frac{2x}{2x^2-6x}$

$= \frac{3(x-3)}{x^3} \cdot \frac{2x}{2x(x-3)} = \frac{3}{x^3}$ miles per minute

2. $\frac{6}{(x+4)} \div \frac{8}{(x^2+2x-8)}$

$(x^2+2x-8) = (x+4)(x-2)$

LCD is $(x+4)(x-2)$

$\frac{6}{(x+4)} \cdot \frac{(x+4)(x-2)}{8}$

$\frac{6(x-2)}{8} = \frac{3(x-2)}{4}$

3. $a^2 + b^2 = c^2$

$4^2 + 20^2 = c^2$

$16 + 400 = c^2$

$\sqrt{c^2} = \sqrt{416}$

$c = 20.4$ ft.

4. $\frac{|x|}{6} + 4 = 16$

$-4 \quad -4$

$(6)\frac{|x|}{6} = 12(6)$

$|x| = 72$

$x = \pm 72$

5. $(6x^3 + 3x^2 + 9x) \div 3x$

$\frac{6x^3}{3x} + \frac{3x^2}{3x} + \frac{9x}{3x}$

$2x^2 + x + 3$

OR

$\frac{6x^3 + 3x^2 + 9x}{3x}$

$\frac{3x(2x^2 + x + 3)}{3x}$

$2x^2 + x + 3$

OR

$\frac{3c}{4} + \frac{3}{8} \le \frac{c}{4} - \frac{5}{8}$

$+\frac{3}{8} \quad -\frac{3}{8}$

$\frac{3c}{4} \le \frac{c}{4} - \frac{8}{8}$

$-\frac{c}{4} \quad -\frac{c}{4}$

$\frac{2c}{4} \le -1$

$\frac{c}{2} \le -1 \cdot 2$

$c \le -2$

-7.2 0 7.2

16. $\frac{3m^3n}{2mn^3} \cdot \frac{4m^2n^3}{15m^2n^2} = \frac{2m^2}{5n}$

OR

$\frac{3m^3n}{2mn^3} \cdot \frac{4m^2n^3}{15m^2n^2} = \frac{2m^5n^4}{5m^3n^5} = \frac{2m^2}{5n}$

17. $\frac{3x^3}{2x^2} + \frac{2x \cdot x}{4x \cdot x} = \frac{6x^3 + 2x^2}{4x^2} = \frac{2x^2(3x+1)}{4x^2}$

$\frac{2x^2(3x+1)}{4x^2} = \frac{3x+1}{2}$

18. $\frac{3c}{4} + \frac{3}{8} \le \frac{c}{4} - \frac{5}{8}$

$\frac{3c}{4} \cdot 8 + \frac{3}{8} \cdot 8 \le \frac{c}{4} \cdot 8 - \frac{5}{8} \cdot 8$

$6c + 3 \le 2c - 5$

$-2c - 3 \quad -2c - 3$

$\frac{4c}{4} \le \frac{-8}{4}$

$c \le -2$

-3 -2 -1 0

19. $-3(1 - x) \ge 6^2$

$-3 + 3x \ge 36$

$+3 \quad +3$

$\frac{3x}{3} \ge \frac{39}{3}$

$x \ge 13$

12 13 14 15

20. $|x| < 2$ less than and

$x < 2$ and $x > -2$

$-2 < x < 2$

-3 -2 -1 0 1 2 3