Algebra 2

Fall 2017 Final Exam Review

Name_____

Hour_____ Date_____

PR Skills

1. $-18 - 6x = 6(1 + 3x)$

$-18 - 6x = 6 + 18x$

$-24 = 24x$

$x = -1$ ✓

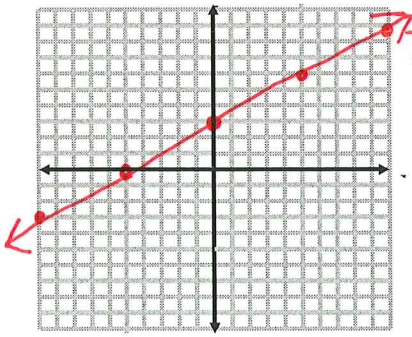
2. $-3(p + 1) < -27$

$-3p - 3 < -27$

$-3p < -24$

$p > 8$ ✓

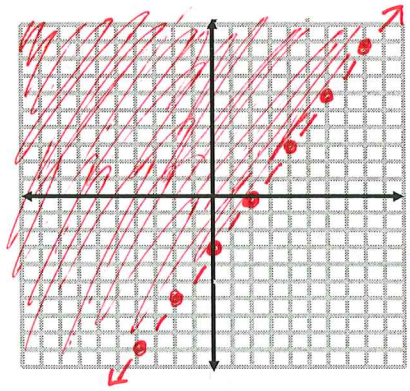
3. Graph. $3x - 5y = -15$



$\frac{-5y}{-5} = \frac{-3x}{-5} - \frac{15}{-5}$

$y = \frac{3}{5}x + 3$

4. Graph. $3x < 2y + 6$



$\frac{-2y}{-2} < \frac{-3x}{-2} + \frac{6}{-2}$

$y > \frac{3}{2}x - 3$

5. Solve the two variable system.

$+\ 8x + 4y = -28$

$3x - 4y = -27$

$4(2x + y = -7)$

$11x = -55$

$x = -5$

$2(-5) + y = -7$

$-10 + y = -7$

$y = (3)$

$(-5, 3)$ ✓

6. There is set of cards that have 15 red cards, 12 blue cards, 8 green cards and 5 yellow cards. What is the probability that you will draw a green card?

$\frac{8}{40} = \frac{1}{5}$

7. Find the mode of the given data:

1 2 3 4

15 13 20 18 14 15 12 13 15 18 20 15

mode = 15 ✓

8. Find the mean for the given data:

$\frac{47 + 60 + 58 + 55 + 52 + 63 + 59 + 70}{8} = 464$

mean = 58 ✓

9. Find the median for the given data:

47 60 58 55 52 63 59 70

47, 52, 55, 58 | 59, 60, 63, 70

median = $58\frac{1}{2}$ ✓

10. There is set of cards that have 15 red cards, 12 blue cards, 8 green cards and 5 yellow cards. What is the probability that you will draw a green card then a blue card with replacement? $\frac{8}{40} \cdot \frac{12}{40} = \frac{3}{50}$ ✓

Skill 1

Solve.

11. $|5 - 2x| + 3 = 8$

$5-2x=5$ | $5-2x=-5$

$-2x=0$ | $-2x=-10$

$x=0$ | $x=5$ ✓

12. $|3x + 5| = 5x + 2$

$3x+5=5x+2$ | $3x+5=-5x-2$

$3=2x$ ✓ | $8x=-7$

$\frac{3}{2}=x$ | $x=-\frac{7}{8}$

13. $7x-3=x-1$ | $7x-3=-x+1$

$6x=2$ | $8x=4$

$x=\frac{1}{3}$ | $x=\frac{1}{2}$

Solve and graph.

13. $-33 < -7x - 12 < -26$

$+12 \quad +12 \quad +12$

$-21 < -7x < -14$

$\frac{-21}{-7} < \frac{-7x}{-7} < \frac{-14}{-7}$

0 1 2 3

$2 < x < 3$

14. $9 + 2x < 7$ or $7 - 5x < -8$

$2x < -2 \qquad -5x < -15$

$x < -1$ or $x > 3$

-1 0 1 2 3

15. $|3x - 2| > 7$

$3x-2>7$ | $3x-2<-7$

$3x>9$ | $3x<-5$

$x>3$ or $x<-\frac{5}{3}$ or $x<-1\frac{2}{3}$

0 3

16. $|m - 3| - 6 \leq 2$

$m-3\leq 8$ | $m-3\geq -8$

$m\leq 11$ | $m\geq -5$

-5 0 11

$4x>-1$ | $3x<5$

$x>-\frac{1}{4}$ | $x<5$

0 5

17. On some interstate highway, the maximum speed a semi can drive is 75 miles per hour. The minimum speed is 45 miles per hour. Write an inequality to represent the speed for a semi on an interstate highway.

$45 \leq x \leq 75$ ✓

Skill 2

Solve the system.

18. $x - 3y + 3z = -4$
$3x + 2z = 11$
$2z = -4$

(5, 1, -2) ✓

$5-3y-6=-4$

$-3y=-3$

$y=1$

$3x+2(-2)=11$

$3x-4=11$

$3x=15$

$x=5$

19. $5x - 3y + 2z = 39$
$4x + 4y - 3z = 34$
$3x - 2y + 6z = 14$

(8, -1, -2) ✓

$4 \cdot (5x - 3y + 2z = 39)$

$3 \cdot (4x + 4y - 3z = 34)$

$2 \cdot (3x - 2y + 6z = 14)$

$20x - 12y + 8z = 156$

$12x + 12y - 9z = 102$

④ $32x - 12z = 258$

⑤ $288x - 92z = 2322$

⑥ $10x + 92z = 62$

$298x = 2384$

$x = 8$

$4x + 4y - 3z = 34$

$+ \; 6x - 4y + 12z = 28$

⑤ $10x + 92z = 62$

$10(1)+5d=\$12.50$

$\frac{5d}{5}=\frac{2.50}{5}$

$d=0.5$

$40h+20d=\$50$

$-35h-20d=-45$

$\frac{5h}{5}=\frac{5}{5}$

$h=\$1$

20. One group of people purchased 10 hot dogs and 5 soft drinks at a cost of $12.50. A second group bought 7 hot dogs and 4 soft drinks at a cost of $9.00. What is the cost of a single hot dog? What is the cost of a single drink?

hot dogs = $1
drink = $0.50

$10h+5d=12.50$

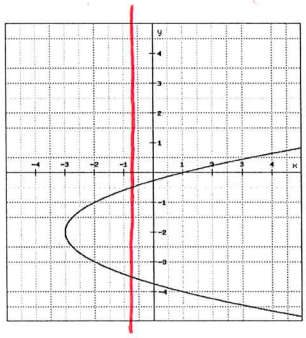
$7h+4d=9.00$

Skill 3

21. Is the relation a function? {(4, 3), (-4, 9), (-2, 5), (0, 3)}

yes ✓

22. Is the graph a function?



no ✓

23. Find the inverse of the function. {(-7, 8), (9, -2), (0, 2)} ✓

$\{(8,-7),(-2,9),(2,0)\}$

24. Find the inverse of the equation. $y = 3x - 5$

$x=3y-5$

$\frac{x+5=3y}{3}$

$y=\frac{1}{3}x+\frac{5}{3}$ ✓

25. Find the inverse of the equation. $f(x)=\frac{4x-3}{5}$

$\frac{x}{1}=\frac{4y-3}{5}$

$5x=4y-3$

$\frac{5x+3=4y}{4}$

$y=\frac{5}{4}x+\frac{3}{4}$ ✓

Let $f(x)=x-3$, $g(x)=x^2-5x+2$, and $h(x)=-2x^2+3x$

26. f(-2) + g(5)

$((-2)-3)+((5)^2-5(5)+2)$

-3 ✓

27. h(x) – g(x)

$(-2x^2+3x)-(x^2-5x+2)$

$-2x^2+3x-x^2+5x-2$

$-3x^2+8x-2$ ✓

28. f(7)·h(-2)

$(7)-3)(-2(-2)^2+3(-2))$

-56 ✓

29. -3h(x) + 4g(x)

$-3(-2x^2+3x)+4(x^2-5x+2)$

$6x^2-9x+4x^2-20x+8$

$(10x^2-29x+8)$ ✓

30. $(f \circ g)(-4)$ $(x^2-5x+2)-3$ x^2-5x-1 $(-4)^2-5(-4)-1$ 35 ✓

31. $(g \circ h)(x)$ $(-2x^2+3x)^2-5(-2x^2+3x)+2$ $4x^4-12x^3+9x^2+10x^2-15x+2$ $4x^4-12x^3+19x^2-15x+2$ ✓

Skill 4

Simplify each expression.

32. $\sqrt{128x^7y^3}$ $8\cdot16$ $4\sqrt{2}$ $8\cdot2$ $4\cdot2$ $2\cdot2$ $8x^3y\sqrt{2xy}$ ✓

33. $\sqrt[3]{-8x^4y^7}$ $4\sqrt{2}$ $2\cdot2$ $-2xy^2\sqrt{xy}$ ✓

34. $(2\sqrt{18})(\sqrt{28})$ $2\sqrt{18\cdot28}$ $9\cdot2$ $3\cdot3$ $2\cdot14$ $2\cdot7$ $12\sqrt{14}$ ✓

35. $\frac{\sqrt[3]{3a^2b^3}}{\sqrt[3]{5ab}}$ $\frac{\sqrt[3]{3ab^2}\cdot\sqrt[3]{5}\cdot\sqrt{5}}{\sqrt[3]{5}\cdot\sqrt[3]{5}\cdot\sqrt[3]{5}}$ $\frac{\sqrt[3]{75ab^2}}{5}$ ✓

36. $\frac{2+\sqrt{3}}{4-\sqrt{2}}\cdot\frac{(4+\sqrt{2})}{(4+\sqrt{2})}=\frac{8+2\sqrt{2}+4\sqrt{3}+\sqrt{6}}{14}$ ✓

	4	$\sqrt{2}$
2	8	$2\sqrt{2}$
$\sqrt{3}$	$4\sqrt{3}$	$\sqrt{6}$

	4	$\sqrt{2}$
4	16	$4\sqrt{2}$
$-\sqrt{2}$	$-4\sqrt{2}$	-2

37. $2\sqrt{75}-6\sqrt{27}+5\sqrt{30}$ $25\cdot3$ $3\cdot9$ $10\cdot3$ $5\cdot5$ $3\cdot3$ $5\cdot2$ $10\sqrt{3}-18\sqrt{3}+5\sqrt{30}$ ✓ $-8\sqrt{3}+5\sqrt{30}$ ✓

Solve. Leave in simplified radical form.

38. $x^2+10x-9=0$ $a=1, b=10, c=-9$ $x=\frac{-10\pm\sqrt{(10)^2-4(1)(-9)}}{2(1)}\rightarrow x=\frac{-10\pm\sqrt{136}}{2}$ $\sqrt{136}$ $2\cdot68$ $2\cdot34$ $2\cdot17$ $x=-5\pm\sqrt{34}$ ✓

39. $3x^2+25x=-42$ $3x^2+25x+42=0$ $a=3, b=25, c=42$ $x=\frac{-25\pm\sqrt{(25)^2-4(3)(42)}}{2(3)}\rightarrow x=\frac{-25\pm\sqrt{121}}{6}$ $x=\frac{-25\pm11}{6}$ ✓ $x=-\frac{7}{3}$ $x=-6$ ✓

40. $x^2-12x=-7$ $x=\frac{12\pm\sqrt{(-12)^2-4(1)(7)}}{2}\rightarrow x=\frac{12\pm\sqrt{116}}{2}$ $\sqrt{116}$ $2\cdot58$ $2\cdot29$ $x=\frac{12\pm2\sqrt{29}}{2}\rightarrow x=6\pm\sqrt{29}$ ✓

Skill 5

Simplify.

41. $i^{\frac{25}{4}}\rightarrow6\frac{1}{4}$ i ✓

42. $3\sqrt{-24}$ $6\cdot4$ $3\cdot2$ $2\cdot2$ $6i\sqrt{6}$ ✓

43. $(3i-5)+(4-2i)$

$-1+i$ ✓

44. $(2+3\sqrt{-25})-(6+2\sqrt{-4})$

$3\cdot 5i$ $2\cdot 2i$

$(2+15i)-(6+4i)$

$2+15i-6-4i$

$-4+11i$

45. $(3+2i)(5+4i)$

$7+22i$ ✓

	5	4i
3	15	12i
2i	10i	-8

46. $(2+\sqrt{-4})(5-\sqrt{-49})$

$(2+2i)(5-7i)$

$24-4i$ ✓

	5	-7i
2	10	-14i
2i	10i	14

47. $3(2i)+4i(3)-2i(-7i)$

$14i^2$

$6i+12i-14$

$18i-14$ ✓

48. $\frac{3}{2i}$ $\cdot\frac{i}{i}$ $\frac{3i}{2i^2}$

$\frac{3i}{-2}$

49. $\frac{2}{5+2i}$ $(5-2i)$ $(5-2i)$

	5	-2i
5	25	
2i		4

$\frac{10-4i}{29}$ ✓

Solve. Leave in simplified radical form.

50. $2x^2-7x=-8$

$a=2, b=-7, c=8$

$2x^2-7x+8=0$

$x=\frac{7\pm\sqrt{(-7)^2-4(2)(8)}}{2(2)} \rightarrow x=\frac{7\pm\sqrt{-15}}{4} \rightarrow \frac{7\pm i\sqrt{15}}{4}$ ✓