
2011-2012

Algebra 2, Semester 2

Instructional Materials for the WCSD Math Common Finals

The Instructional Materials are for students and teacher use and are aligned to the Math Common Final test blueprint for this course. When used as test practice, success on the Instructional Materials does not guarantee success on the district math common final.

Students can use these Instructional Materials to become familiar with the format and language used on the district common finals. Familiarity with standards vocabulary and interaction with the types of problems included in the Instructional Materials can result in less anxiety on the part of the students.

Teachers can use the Instructional Materials in conjunction with the course guides to ensure that instruction and content is aligned with what will be assessed. The Instructional Materials should not dictate the depth or full range of learning that should occur in the classroom.

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1. Simplify: $8\sqrt[3]{27} + \sqrt[3]{40} - 6\sqrt[3]{135}$
- A. $24 - 16\sqrt[3]{5}$
- B. $8\sqrt[3]{5}$
- C. $8\sqrt[3]{3} - 16\sqrt[3]{5}$
- D. $2\sqrt[3]{68}$
2. Simplify: $\frac{4^{\frac{2}{3}} \cdot 64^{\frac{2}{3}}}{4^{\frac{4}{3}}}$
- A. $2 \cdot \sqrt[3]{2}$
- B. $32 \cdot \sqrt[3]{2}$
- C. 4
- D. $4 \cdot \sqrt[3]{4}$
3. Simplify, assume all variables are positive: $\sqrt[4]{625x^{48}y^{36}z^{72}}$
- A. $5x^{44}y^{82}z^{68}$
- B. $\sqrt{5x^{12}y^9z^{18}}$
- C. $5x^{12}y^9z^{18}$
- D. $25x^{24}y^{18}z^{36}$
4. Simplify, assume all variables are positive: $\frac{\sqrt[3]{c^5} \cdot \sqrt[3]{c^4}}{\sqrt[3]{c^{10}}}$
- A. $\frac{\sqrt[3]{c^2}}{c}$
- B. $\frac{\sqrt[3]{c^9}}{c}$
- C. $\frac{\sqrt[3]{c^{20}}}{c}$
- D. $\frac{1}{c}$

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5. Find $f(x) - g(x)$ and $f(x) + g(x)$ for $f(x) = 5x^2 + 6x - 4$
 $g(x) = 3x^2 - 5x + 24$
- A. $f(x) - g(x) = 2x^2 + 11x - 28$ and $f(x) + g(x) = 8x^2 + x + 20$
B. $f(x) - g(x) = 2x^2 + 1x + 20$ and $f(x) + g(x) = 8x^2 + x + 20$
C. $f(x) - g(x) = 2x^2 + 11x - 28$ and $f(x) + g(x) = 8x^2 + 11x - 20$
D. $f(x) - g(x) = -2x^2 - 11x + 28$ and $f(x) + g(x) = 8x^2 + x + 20$
6. Find $g(h(x))$ and $h(g(x))$ for $g(x) = 5x$
 $h(x) = 3x + 8$
- A. $g(h(x)) = 40 - 15x$ and $h(g(x)) = 8 - 15x$
B. $g(h(x)) = 15x + 40$ and $h(g(x)) = 15x + 8$
C. $g(h(x)) = 15x^2 + 40$ and $h(g(x)) = 15x^2 + 8$
D. $g(h(x)) = 15x^2 + 40x$ and $h(g(x)) = 15x^2 + 8$
7. Find the inverse function for $f(x) = -7x + 6$.
- A. $f^{-1}(x) = 7x - 6$
B. $f^{-1}(x) = \frac{-x + 6}{7}$
C. $f^{-1}(x) = 7x + 6$
D. $f^{-1}(x) = \frac{x - 6}{7}$
8. Find the inverse function for $g(x) = x^2 + 5$, over the domain $x \geq 0$.
- A. $g^{-1}(x) = \pm\sqrt{x - 5}$
B. $g^{-1}(x) = \sqrt{x} - 5$
C. $g^{-1}(x) = x^2 - 5$
D. $g^{-1}(x) = \pm\sqrt{y - 5}$

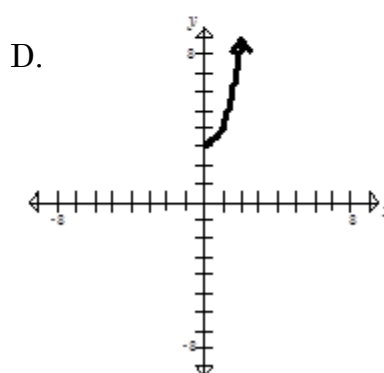
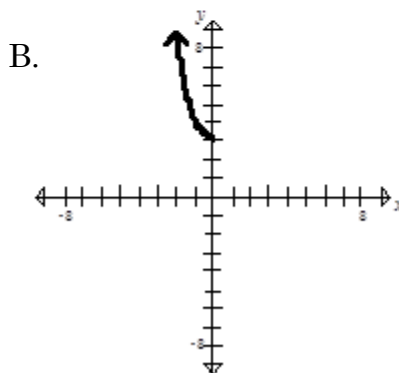
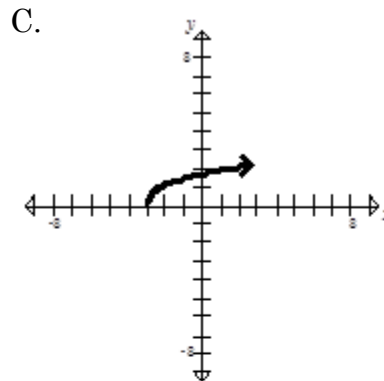
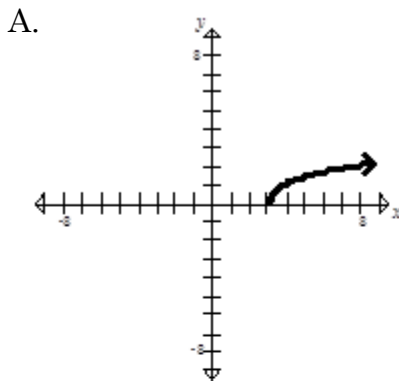
9. Solve: $\sqrt{5x+9} - 10 = 12$
- A. $x = 95$
 - B. $x = 2.6$
 - C. $x = -1$
 - D. *no solution*
10. Solve: $\sqrt{8x+3} = -2$
- A. $x = \frac{-1}{8}$
 - B. $x = \frac{1}{8}$
 - C. $x = \frac{5}{8}$
 - D. *no solution*
11. Solve: $\sqrt{10x+14} > 22$
- A. $x \leq \frac{-7}{5}$ or $x > 47$
 - B. $\frac{-7}{5} \leq x < 47$
 - C. $x \geq \frac{-7}{5}$
 - D. $x > 47$
12. Solve: $\sqrt{2x-3} + 1 \leq 7$
- A. $x \geq \frac{3}{2}$
 - B. $x \leq \frac{39}{2}$
 - C. $x \leq \frac{3}{2}$ or $x \geq \frac{39}{2}$
 - D. $\frac{3}{2} \leq x \leq \frac{39}{2}$

13. State the Domain and Range of the function: $g(x) = 6 + \sqrt{x-3}$
- A. Domain: $x \geq -3$ Range: $y \geq 6$
 - B. Domain: $x \geq 3$ Range: $y \geq 6$
 - C. Domain: $x \geq -3$ Range: $y \geq 0$
 - D. Domain: $x \geq 3$ Range: *all real numbers*

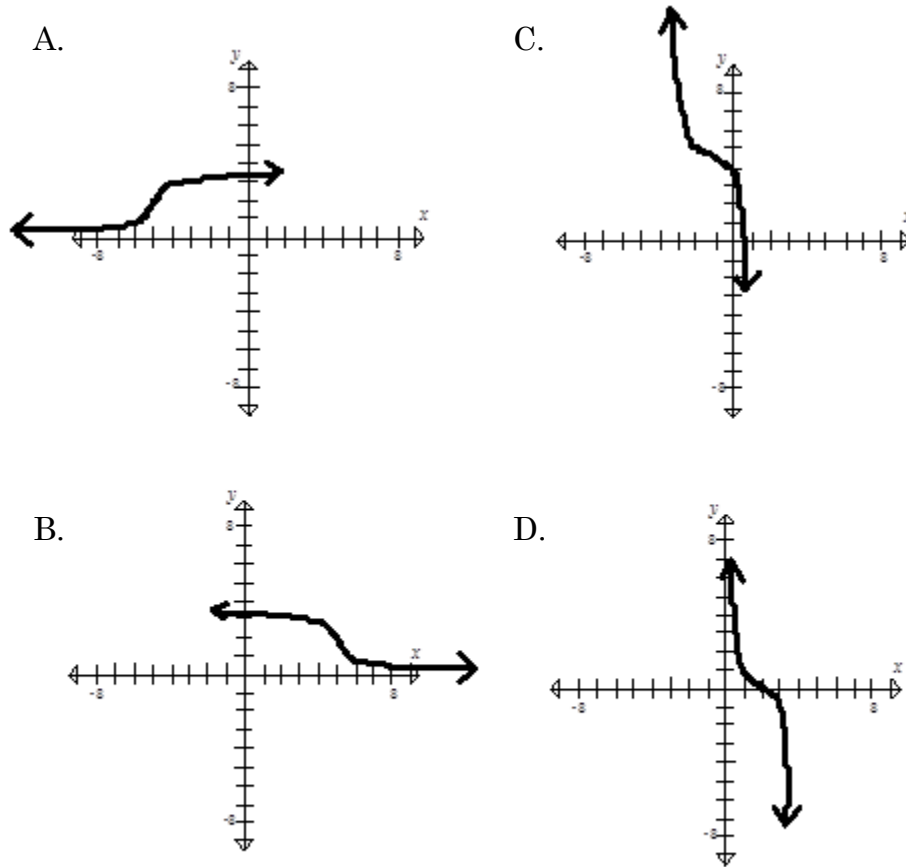
14. Which statement describes the end behavior of the function $f(x) = \sqrt{x+5}$
- A. as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$
 - B. as $x \rightarrow +\infty$, $f(x) \rightarrow -\infty$
 - C. as $x \rightarrow -\infty$, $f(x) \rightarrow +\infty$
 - D. as $x \rightarrow +\infty$, $f(x) \rightarrow +\infty$

WA 2.12.4.3 and WA 2.12.4.4

15. Which of the following represents the graph of $y = \sqrt{x-3}$?



16. Translate the graph of $f(x) = \sqrt[3]{x}$ two (2) units up and five (5) units left. Which of the following is the graph after the translations?



WA 2.12.4.3

17. State the Domain and Range of the function: $y = 2^x + 1$
- | | | |
|----|---------------------------------|--------------------------------|
| A. | Domain: <i>all real numbers</i> | Range: $y > 1$ |
| B. | Domain: <i>all real numbers</i> | Range: $y > 2$ |
| C. | Domain: $x \geq 2$ | Range: $y > 0$ |
| D. | Domain: $x \geq 1$ | Range: <i>all real numbers</i> |
18. State the Domain and Range of the function: $y = \log_3(x - 2)$
- | | | |
|----|---------------------------------|--------------------------------|
| A. | Domain: <i>all real numbers</i> | Range: <i>all real numbers</i> |
| B. | Domain: $x > 2$ | Range: $y \geq 2$ |
| C. | Domain: $x > 2$ | Range: $y \geq 0$ |
| D. | Domain: $x > 2$ | Range: <i>all real numbers</i> |

19. Simplify: $\log_3 243 + \ln(e^{10}) - \log_5 625$
- A. -272
 - B. 19
 - C. 11
 - D. *not possible*
20. Simplify to one logarithmic expression: $\log 36 - 5 \log 4 + \log 20$
- A. $\log 36$
 - B. $\log \frac{45}{16}$
 - C. $\log \frac{45}{64}$
 - D. $\log(-968)$
21. Simplify to one natural logarithmic expression: $3 \ln(a) + 2 \cdot \ln(b) - 4 \ln(c)$
- A. $\ln\left(\frac{a^3 b^2}{c^4}\right)$
 - B. $\ln\left(\frac{a^3 + b^2}{c^4}\right)$
 - C. $\ln(a^3 + b^2 - c^4)$
 - D. $\ln\left(\frac{3a \cdot 2b}{4c}\right)$
22. Simplify: $8^{\log_8(5)}$
- A. 32768
 - B. 40
 - C. 5
 - D. *not possible*
23. Solve: $11^x = 247$
- A. $x \approx 1.35$
 - B. $x \approx 2.30$
 - C. $x \approx 2.37$
 - D. *no solution*

24. Solve: $4^{5x} = 64^{x+8}$
- A. $x = -4$
 - B. $x = -2$
 - C. $x = 2$
 - D. $x = 12$
25. Solve: $\log_7(2x+9) = \log_7 x + \log_7(x+10)$
- A. $x = -9$
 - B. $x = -1$ and $x = 9$
 - C. $x = 1$
 - D. *no solution*
26. Solve: $\log_8(x-12) + \log_8 x = 2$
- A. $x = -4$ and $x = 16$
 - B. $x = 12$
 - C. $x = 16$
 - D. *no solution*
27. Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$. If \$7500 is deposited in an account at the bank and earns 7% annual interest, compounded quarterly, what is the amount in the account, rounded to the nearest dollar, after 7 years?
- A. \$8468
 - B. \$12191
 - C. \$49866
 - D. \$685,680
28. Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$. If \$5000 is deposited in an account at the bank and earns 5% annual interest, compounded annually, what is the amount of time needed to in order to have \$8750?
- A. $t \approx 127.37$
 - B. $t \approx 11.47$
 - C. $t \approx 1.38$
 - D. $t \approx .087$

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29. If \$5000 is invested at a rate of 5% compounded continuously, find the balance in the account after 5 years. Use the formula $A = Pe^{rt}$.
- A. \$4581.45
 - B. \$6420.13
 - C. \$6931.47
 - D. \$60912.47
30. If \$7000 is invested at a rate of 7% compounded continuously, what amount of time would be needed to have a balance of \$7700? Use the formula $A = Pe^{rt}$.
- A. $t \approx .036$
 - B. $t \approx .73$
 - C. $t \approx 1.36$
 - D. $t \approx 15.72$
31. State the Domain and Range of the function: $y = \frac{x-6}{2x-8}$
- A. Domain is all real numbers except 4; Range is all real numbers except $\frac{1}{2}$
 - B. Domain is all real numbers except 4; Range is all real numbers except 0
 - C. Domain is all real numbers except 4; Range is all real numbers except $\frac{3}{4}$
 - D. Domain is all real numbers except -4 ; Range is all real numbers except 0
32. Which statement describes the end behavior of the function $f(x) = \frac{3x+4}{x-5}$
- A. as $x \rightarrow -\infty$, $f(x) \rightarrow +3$ and as $x \rightarrow +\infty$, $f(x) \rightarrow +5$
 - B. as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$ and as $x \rightarrow +\infty$, $f(x) \rightarrow +3$
 - C. as $x \rightarrow -\infty$, $f(x) \rightarrow +3$ and as $x \rightarrow +\infty$, $f(x) \rightarrow +3$
 - D. as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$ and as $x \rightarrow +\infty$, $f(x) \rightarrow +3$

33. Translate the graph of $f(x) = \frac{1}{x}$ two (2) units up and one (1) unit right. Which of the following is the function after the translations?

A. $f(x) = \frac{1}{x+1} + 2$

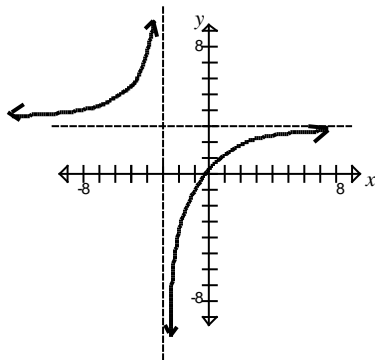
B. $f(x) = \frac{2x-1}{x-1}$

C. $f(x) = \frac{x+2}{x+1}$

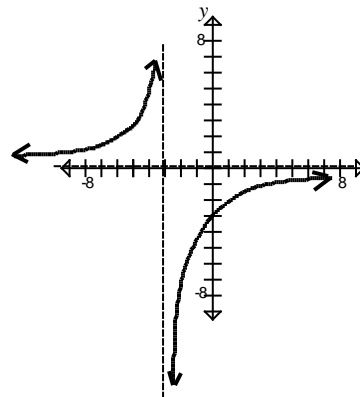
D. $f(x) = \frac{2}{x-1}$

34. Which is a graph of $f(x) = \frac{3x+1}{x+3}$ with any vertical or horizontal asymptotes indicated by dashed lines?

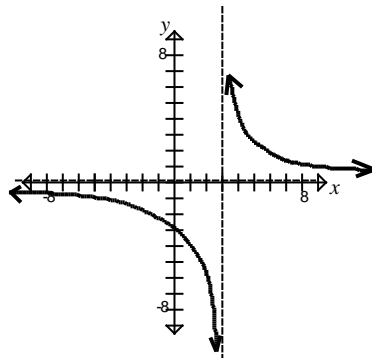
A.



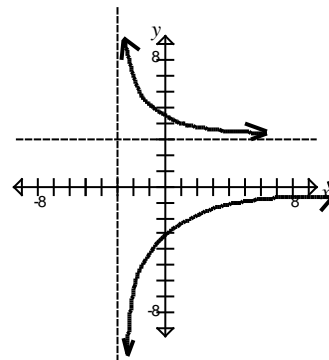
C.



B.



D.



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35. Simplify: $\frac{x^2 - x - 30}{2x^2 - 11x - 6}$
- A. $\frac{(x+5)(x+6)}{(2x+1)(x-6)}$ C. $\frac{(x+5)}{(2x+1)}$
- B. $\frac{(x+5)(x-6)}{(2x+1)(x+6)}$ D. $\frac{(2x+1)}{(x+5)}$
36. Perform the indicated operation: $\frac{x^2 - 3x - 10}{x^2 + 2x - 3} \div \frac{x+5}{x+3}$
- A. $\frac{(x-5)(x+2)}{(x-1)(x+5)}$ C. $\frac{(x+2)}{(x-1)}$
- B. $\frac{(x-5)(x+3)(x+2)}{(x-1)(x-3)(x+5)}$ D. $\frac{(x-1)}{(x+2)}$
37. Perform the indicated operation: $\frac{7}{x-4} - \frac{11}{x-4}$
- A. $\frac{-77}{x-4}$ C. $\frac{18}{x-4}$
- B. $\frac{-77}{(x-4)^2}$ D. $\frac{-4}{x-4}$
38. Perform the indicated operation: $\frac{4x+5}{x^2-25} + \frac{7}{x-5}$
- A. $\frac{11x+40}{x^2-25}$ C. $\frac{4x+12}{x^2-25}$
- B. $\frac{11x+40}{x-5}$ D. $\frac{4x+12}{x-5}$
39. Solve: $\frac{x+4}{x-5} = \frac{x-3}{x+6}$
- A. $x = 2$ C. $x = -2$
- B. $x = \frac{-1}{2}$ D. $x = \frac{1}{2}$

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44. Given the equation $y^2 = \frac{1}{5}x$ and the translation of that graph up 3 units and left 2 units, what would the new equation be after the translation?
- A. $(y + 3)^2 = \frac{1}{5}(x - 2)$
- B. $(y - 3)^2 = \frac{1}{5}(x + 2)$
- C. $(y + 3)^2 = \frac{1}{5}(x + 2)$
- D. $(y - 3)^2 = \frac{1}{5}(x - 2)$
45. Write the standard equation of the circle $3x^2 + 3y^2 + 24y + 18x - 27 = 0$
- A. $(x + 3)^2 + (y + 4)^2 = 34$
- B. $(x + 6)^2 + (y + 8)^2 = 34$
- C. $(x - 4)^2 + (y - 3)^2 = 34$
- D. $(x + 3)^2 + (y + 4)^2 = \sqrt{34}$
46. Translate the graph of $x^2 + y^2 = 8$ six (6) units down and two (2) unit right. Which of the following is the equation after the translations?
- A. $(x + 2)^2 + (y - 6)^2 = 8$
- B. $(x - 2)^2 + (y + 6)^2 = 8$
- C. $(x + 2)^2 + (y + 6)^2 = 8$
- D. $(x - 6)^2 + (y + 2)^2 = 8$

47. The table shows the status of 500 registered high school students. What is the probability that a randomly selected student is a female given that they have a part time job?

- A. 0.67
B. 0.53
C. 0.18
D. 0.82

	Full time job	Part time job
Female	50	225
Male	25	200

48. What is the probability of tossing a coin 30 times and getting exactly 10 tails?
- A. 1
B. 0.97
C. 0.29
D. 0.028
49. The heights of women are normally distributed. The mean height for women is 64 inches with a standard deviation of 2.5 inches. What is the probability that a woman is shorter than 59 inches?
- A. 0.015
B. 0.025
C. 0.160
D. 0.500
50. The heights of men are normally distributed. The mean height for men is 70 inches with a standard deviation of 3 inches. What is the approximate probability that a man is taller than 67 inches and shorter than 76 inches?
- A. 0.34
B. 0.68
C. 0.73
D. 0.82

Algebra 2 – S2 – Key for Instructional Materials

2011-2012

1.	A	21.	A	41.	A
2.	D	22.	C	42.	B
3.	C	23.	B	43.	A
4.	A	24.	D	44.	B
5.	A	25.	D	45.	A
6.	B	26.	C	46.	B
7.	B	27.	B	47.	B
8.	A	28.	B	48.	D
9.	A	29.	B	49.	B
10.	D	30.	C	50.	D
11.	D	31.	A		
12.	D	32.	C		
13.	B	33.	B		
14.	D	34.	A		
15.	A	35.	C		
16.	A	36.	A		
17.	A	37.	D		
18.	D	38.	A		
19.	C	39.	B		
20.	C	40.	D		