

Intermediate Algebra and Intermediate Algebra with Review Sample Final_{Spring2012}

The final exam will contain 30 questions. Twenty of the questions will be multiple-choice and ten of them will be open-ended. This will be an in-class, closed book exam. A formula sheet will be provided. This sample final contains a variety of multiple-choice and open-ended questions.

1. Factor completely, if possible. If not possible, write "Not Factorable." $ar + au + ry + uy$

2. Solve: $\frac{1}{3x} - \frac{5}{9} = \frac{5}{6x}$

A) $x = \frac{-9}{10}$ B) $x = 0, \frac{-9}{10}$ C) $x = \frac{9}{10}$ D) $x = -4, \frac{-9}{10}$

3. Solve: $\frac{x}{x+5} + \frac{3x}{x^2+7x+10} = \frac{2}{x+2}$

A) $x = -6, 2$ B) $x = -5, -2$ C) $x = -6, -7$ D) $x = 2$

4. Find the y - intercept and x - intercept for the given equation. $6x + 3y = -18$

5. Solve: $4x^2 = 49$

6. Find the value of $f(4)$ for $f(x) = 3x^2 + 7x + 9$

7. Solve: $(x + 3)^2 = 9$

8. Solve the system:
$$\begin{cases} -8x + 2y = -8 \\ 6x + y = -14 \end{cases}$$

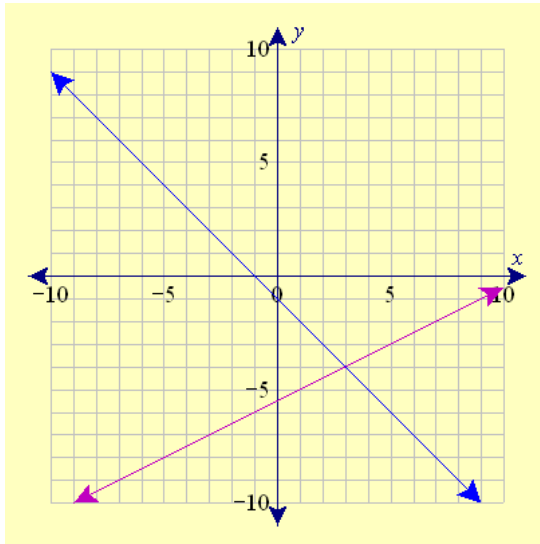
9. Rationalize the denominator and simplify if possible. $\frac{\sqrt{14}}{\sqrt{6}}$

10. Cindy and John, working together, can mow the lawn in 10 hours. Working alone, John takes twice as long as Cindy. How long does it take Cindy to mow the lawn alone?
11. Solve: $u + 4 = \sqrt{5u + 14}$
12. Solve: $\sqrt{4t + 1} = 3$
13. Solve: $\frac{x - 2}{x - 8} = \frac{3}{2}$
- A) $x = 20, -2$ B) $x = 4$ C) $x = -20$ D) $x = 20$
14. Simplify: $8^{-\frac{4}{3}}$
- A) Not a Real Number B) $\frac{-1}{16}$ C) $\frac{1}{16}$ D) $\frac{1}{2}$
15. Solve: $x^2 + 10x + 14 = 0$
16. Find the product in standard form: $(-8 - i)(1 + 2i)$
17. Solve: $3x^2 + 13x - 31 = -1$
- A) $x = \frac{1}{6}, \frac{3}{5}$ B) $x = 6, \frac{-3}{5}$ C) $x = -6, \frac{5}{3}$ D) $x = \frac{-1}{6}, \frac{3}{5}$
18. Jeff recently drove to visit his parents who live 380 miles away. On his way there his average speed was 9 miles per hour faster than on his way home (he ran into some bad weather). If Jeff spent a total of 19 hours driving, find the two rates.
19. Solve: $7x^2 + 3x = 0$
20. Solve: $6 = \sqrt{8 + t} + 2$

21. Simplify the expression: $3\sqrt{80} - 4\sqrt{125} + \sqrt{20}$

22. Find the equation (in slope-intercept form) of the line passing through the points $(1, -1)$, $(2, 2)$

23. Determine the solution of the system graphed below



24. Solve the system:
$$\begin{cases} 6x + 2y = 22 \\ y = 5x + 3 \end{cases}$$

25. Factor completely, if possible. If not possible, write "Not Factorable." $25x^2 + 40xy + 16y^2$

26. Factor completely, if possible. If not possible, write "Not Factorable." $25 + 16x^2$

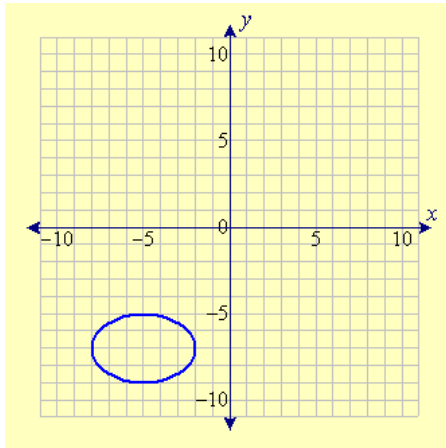
27. Factor completely, if possible. If not possible, write "Not Factorable." $81y^3 - 192$

28. Find the equation (in slope-intercept form) of the line with the given slope that passes through the point
slope: $\frac{1}{3}$, ordered pair: $(-1, -1)$

29. Factor completely, if possible. If not possible, write "Not Factorable." $7x^2y + 14xy^3$
30. Solve: $\frac{-4x}{5} = \frac{-3x}{4} + \frac{1}{2}$
31. Simplify: $\sqrt[3]{16x^9y^5}$
32. Sam invests a total of \$5000, part at 7% and the remainder at 13%. How much does he invest at each rate if his annual interest is \$560?
33. Simplify: $(2 - 8i) - (-6 - i) - (4 + 9i)$
- A) $12 - 16i$ B) $4 - 16i$ C) 0 D) $4 + 4i$
34. If y is inversely proportional to x^3 and $y = 13$ when $x = 6$, find y if $x = 9$. (Round off your answer to the nearest hundredth.)
35. Factor completely, if possible. If not possible, write "Not Factorable." $a^2 - 2ab - 24b^2$
36. Admission to a baseball game is \$2.50 for general admission and \$6.00 for reserved seats. The receipts were \$3565.50 for 1051 paid admissions. How many of each ticket were sold?
37. Find the slope of a line that is **a)** parallel and **b)** perpendicular to the line: $-3x - 5y = 2$
- A) Parallel slope: $\frac{3}{5}$, Perpendicular slope: $\frac{5}{3}$ B) Parallel slope: $\frac{-3}{5}$, Perpendicular slope: $\frac{3}{5}$
- C) Parallel slope: $\frac{-3}{5}$, Perpendicular slope: $\frac{5}{3}$ D) Parallel slope: $\frac{-3}{5}$, Perpendicular slope: $\frac{-3}{5}$
38. Factor completely, if possible. If not possible, write "Not Factorable." $4x^2 + 21x + 20$
39. Solve: $y^2 - 6y - 3 = 0$

40. Find the quotient: $\frac{9 - 4i}{4 + 7i}$
- A) $\frac{8}{65} + \frac{79}{65}i$ B) $\frac{8}{65} - \frac{79}{65}i$ C) $\frac{9 - 4i}{65}$
41. Solve: $\sqrt{19 + 2y} = y + 2$
42. Solve: $(9x + 2)(x + 4) = 0$
- A) $x = 4, \frac{-2}{9}$ B) $x = -2, \frac{-2}{9}$ C) $x = 4, \frac{2}{9}$ D) $x = -4, \frac{-2}{9}$
43. Factor completely, if possible. If not possible, write "Not Factorable." $64x^3 + 27$
44. Simplify: $\sqrt{96}$
45. At the new light bulb plant, 6 out of 20 light bulbs produced are defective. If the daily production is 4800 light bulbs, how many are defective?
- Step 1.** Set up the proportion. Use x as the variable.
- Step 2.** Solve your equation.
46. How many liters each of a 25% acid solution and a 35% acid solution must be used to produce 60 liters of a 30% acid solution? (Round to two decimal places if necessary.)
47. Multiply and simplify the radical expressions: $(2\sqrt{7} - \sqrt{6})(3\sqrt{7} + 3\sqrt{6})$
48. Solve: $6x^2 + 2 = 5x$
49. Factor completely, if possible. If not possible, write "Not Factorable." $9x^2 + 39x + 36$

50.



Step1. Is the graph a function?

A) Yes B) No

Step2. State the domain and range of the graph.

51. Solve: $x^2 + x - 16 = 0$

52. Factor completely, if possible. If not possible, write "Not Factorable." $12y^3 + 15y^2 - 4y - 5$

53. Factor completely, if possible. If not possible, write "Not Factorable." $9x^2 - 4$

54. Solve: $3x^2 = 24$

55. It takes 13 hours to drive to your sister's house, 676 miles away. How long would you estimate the drive to be to the beach, a distance of 312 miles?

Step1. Set up the proportion. Use x as the variable.

Step2. Solve your equation.

56. Factor completely, if possible. If not possible, write "Not Factorable." $x^2 + 11x + 30$

57. The volume of a gas in a container varies inversely as the pressure on the gas. If a gas has a volume of 360 cubic inches under a pressure of 10 pounds per square inch, what will be its volume if the pressure is increased to 17 pounds per square inch? (Round off your answer to the nearest cubic inch.)

58. Rationalize the denominator and simplify if possible. $\frac{4}{7 - \sqrt{6}}$

59. Simplify: $\left(\frac{36}{25}\right)^{\frac{1}{2}}$

60. A boat can travel 54 mph in still water. If it travels 126 miles with the current in the same amount of time it travels 90 miles against the current, what is the speed of the current?

- A) 54 mph B) 9 mph C) 6939 mph

61. Solve the system:
$$\begin{cases} 2x + y = -1 \\ 10x + 2y = 16 \end{cases}$$

62. The distance that a free falling object falls is directly proportional to the square of the time it falls (before it hits the ground). If an object fell 69 ft in 5 seconds, how far will it have fallen by the end of 7 seconds? (Leave the variation constant in fraction form or round to at least 2 decimal places. Round your final answer to the nearest foot.)

63. Factor completely, if possible. If not possible, write "Not Factorable." $7x^5 - 35x^4 + 42x^3$

64. One number is $\frac{2}{3}$ of another number. The sum of the two numbers is 10. Find the two numbers.