

GNC 064: Fundamentals of Algebra
Review & Practice Problems for Comprehensive Final Exam

- Instructions **FIRST** Work out each problem completely as you normally would, showing all your work.
(On the exam, you will have to show your work RIGHT ON THE TEST PAGES.)
- THEN** Choose the best multiple-choice answer and circle it.
- FINALLY** On the exam, you will also transfer your multiple-choice answers to a ScanTron form;
you don't have to do that now.

YOUR WORK WILL BE COUNTED. BE NEAT AND COMPLETE – YOU COULD GET PARTIAL CREDIT!

PART A: Basic Mathematics

DO NOT USE A CALCULATOR ON PART A

1. $-3 + 2(4 - 5) = ?$
- a. 0 b. 1 c. -1 d. -5 e. 5
2. $-7(-3 + 1)^2 = ?$
- a. 28 b. -28 c. 196 d. -56 e. 484
3. $4 - 8(-2 + 5) + 3(-5 + 2) = ?$
- a. -29 b. 13 c. -21 d. 3 e. 21
4. $\frac{1}{6} + \frac{1}{8} = ?$
- a. $\frac{2}{14}$ b. $\frac{1}{14}$ c. $\frac{7}{24}$ d. $\frac{1}{7}$ e. 14
5. $\frac{4}{5} - \frac{6}{7} = ?$
- a. -1 b. $\frac{-2}{12}$ c. $\frac{-2}{35}$ d. 1 e. $\frac{2}{35}$
6. $3\frac{2}{5} + 5\frac{1}{3} = ?$
- a. $8\frac{3}{8}$ b. $15\frac{2}{15}$ c. $8\frac{11}{15}$ d. $2\frac{1}{3}$ e. $9\frac{1}{15}$

Part A (cont.) DO NOT USE A CALCULATOR ON PART A

7. $\frac{15}{4} \div \frac{20}{9} = ?$

a. $\frac{80}{135}$

b. $\frac{27}{16}$

c. $\frac{25}{3}$

d. $\frac{3}{25}$

e. -1

8. Convert 27% to decimal notation:

a. .027

b. .27

c. 2.7

d. $\frac{1}{2.7}$

e. 27.00

9. Convert $6\frac{3}{4}\%$ to decimal notation:

a. 6.75

b. .0675

c. 675.00

d. 6.34

e. .0634

10. $\frac{-3+2(4-5)}{9-4} = ?$

a. $\frac{-1}{3} + 5$

b. $\frac{-3}{3} - \frac{1}{2}$

c. -1

d. $\frac{1}{5}$

e. $\frac{-1}{5}$

11. What is 25% of 36?

a. 25.36

b. 36.25

c. 90.00

d. $\frac{36}{25}$

e. 9

12. $\frac{-5+2(3-1)^2}{4+3^2} = ?$

a. $\frac{3}{49}$

b. $\frac{3}{13}$

c. $\frac{-12}{49}$

d. $\frac{-12}{13}$

e. $\frac{-13}{49}$

13. $\frac{1}{18} - \frac{1}{20} = ?$

a. $\frac{0}{-2}$

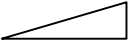
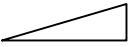
b. $\frac{1}{180}$

c. 2

d. -2

e. $\frac{-2}{180}$

Part B: fundamental Algebra FROM HERE ON, YOU MAY USE A CALCULATOR

14. Jim earns \$3410 more than three times the amount Tim makes. If we let T be the amount (in \$) Tim makes, which of the following expressions would represent the amount Jim makes?
- a. 3410 b. $T + 3410$ c. $3T + 3410$ d. $T + 3T + 3410$ e. $3(T + 3410)$
15. A store offers its employees a 20% discount. If an employee is able to buy a new refrigerator for \$1152, what was its original (regular) price?
- a. \$2304 b. \$921.60 c. \$1382.40 d. \$1440 e. \$1728
16. Ryan's rent just increased by 30%. If we let R be his old rent (in \$), which expression would represent his new rent?
- a. .30 b. $.30R$ c. $R + .30$ d. $R + .30R$ e. $R(R + .30)$
17. The base of a right triangle  is 12 m more than its height. Its hypotenuse is 3 m less than twice its height. If we let h be its height (in meters), then which expression would represent its hypotenuse?
- a. $h + 12$ b. $h + 3$ c. $h - 3$ d. $2h + 3$ e. $2h - 3$
18. The base of a right triangle  is 12 m more than its height. Its hypotenuse is 3 m shorter than twice its height. If we let h be its height (in meters), then which expression would represent its perimeter?
- a. $\frac{(h+12)h}{2}$ b. $(h+12) + (h-3) + 2$ c. $2h + (2h+12)$ d. $2h + 2(h+12)$ e. $h + h + 12 + 2h - 3$
19. Simplify $3x - 5(2x + 3)$
- a. $6x^2 - x - 15$ b. $-4x - 12$ c. $-7x - 15$ d. $-7x + 3$ e. $-4x - 15$
20. Simplify $5 - 2(3x + 5)$
- a. $-6x - 5$ b. $9x + 15$ c. $10 - 6x$ d. $9x + 10$ e. $6x - 5$
21. Which of these inequalities (if any) are true?
- I. $-7 > -3$
II. $3 - 7 \leq -1(4)$
III. $4 - 3^2 < 1$
- a. I and II are true b. II and III are true c. I and III are true d. All are true. e. All are false.

22. Which of the following points is/are in the solution set of the inequality $3y - 2x < -5$?

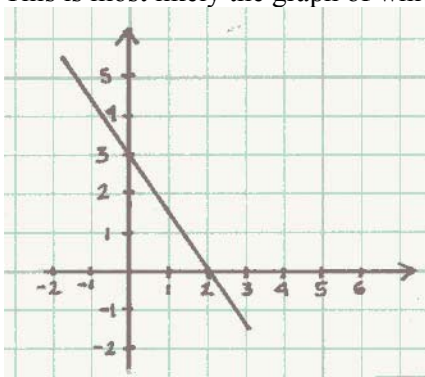
- I. (0,0)
- II. (2,3)
- III. (-4,-1)

- a. Only I b. Only II c. Only III d. All of them e. None of them

23. Solve $4x - 3(x + 2) = 0$ The solution is ?

- a. 6 b. -6 c. -2 d. 2 e. $\sqrt{2}$

24. This is most likely the graph of which equation?



- a. $3x - 2y = 6$
- b. $2x - 3y = 6$
- c. $3x + 2y = 0$
- d. $2x + 3y = 6$
- e. $3x + 2y = 6$

25. What is the slope of the graph of $2x - 7y = 10$?

- a. $\frac{2}{7}$ b. $\frac{7}{2}$ c. $-\frac{10}{7}$ d. 5 e. $-\frac{2}{7}$

26. When you solve this system, what is the y-coordinate of the solution?

$$\begin{aligned} 5x - 8y &= 11 \\ -3x + y &= 7 \end{aligned}$$

- a. $\frac{-67}{19}$ b. $\frac{-68}{19}$ c. $\frac{68}{29}$ d. $\frac{67}{29}$ e. $\frac{-29}{19}$

27. Convert to Standard Form [$Ax + By = C$, no fractions, $A > 0$] :

$$y = \frac{5}{3}x - \frac{2}{9}$$

- a. $15x + 9y = 2$ b. $15x - 9y = 2$ c. $15x - 9y = -2$ d. $3y + 5x = 6$ e. $5x - 3y = 18$

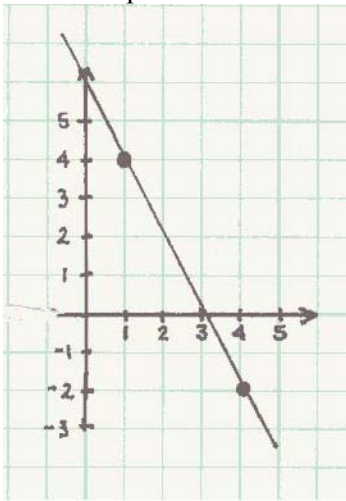
28. Which of the following lines goes through the point $(-4,3)$?

- a. $-4x + 3y = 0$ b. $3x - 4y = 0$ c. $3x + 4y = 0$ d. $4x + 3y = 0$ e. $x - 4 + y + 3 = 0$

29. Solve $5x - 3(2x + 7) = 3x - 5(2x - 7)$. The solution is ?

- a. 0 b. $\frac{28}{3}$ c. $\frac{14}{3}$ d. $\frac{7}{3}$ e. $\frac{-7}{3}$

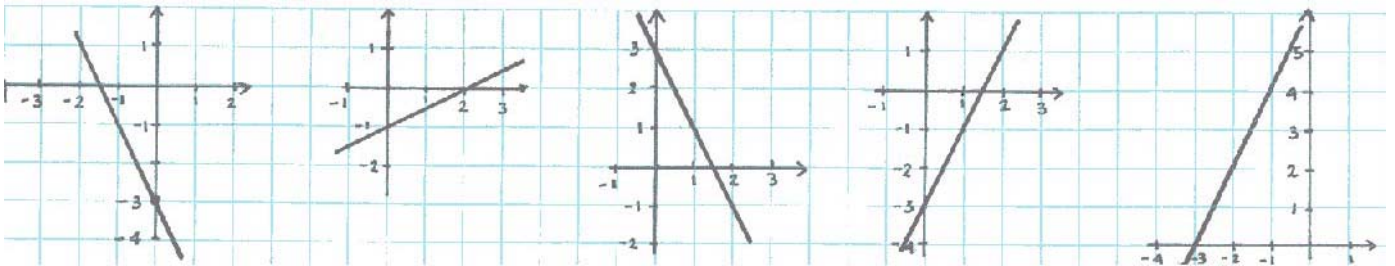
30. Give the slope of this line:



- a. $\frac{6}{5}$ b. $\frac{5}{6}$
c. -2 d. $-\frac{1}{2}$
e. $\frac{1}{2}$

31. Which of these is most likely the graph of $y = 2x - 3$?

- a. b. c. d. e.



32. When you solve this system what is the x-coordinate of the solution?

$$\begin{aligned} 3x + 5y &= 15 \\ -2x + 3y &= 9 \end{aligned}$$

- a. 0 b. 3 c. 5 d. $\frac{-9}{2}$ e. Not enough information to find it

33. A sanitation technician needs 20 gallons of a strong cleaning solution with 28% TSP in it. She has on hand some weak cleaning solution, only 8% TSP, and can get some pure TSP from her company's headquarters. If we let w be the amount of weak (8%) cleaning solution (in gallons) and let p be the amount of pure TSP, (in gallons), then which system, when solved, will tell her how much of each she must mix?
- a. $28w + 8p = 20$
 $w + p = 20(.28)$
- b. $w + p = 20$
 $.28w + .08p = 20$
- c. $0w + .28p = .08(20)$
 $w + p = 20$
- d. $w + p = 20$
 $.08w + p = .28(20)$
- e. $w + p = 20$
 $.08w + 1.00p = .28$
34. Sally's Sweet Shop is getting ready for Mother's Day. They want to mix *Bridge Mix*, worth \$4.50 a pound, and *Fudge Fantasy*, worth \$12.00 a pound, to get 50 pounds of *Mixture for Mother* to be worth \$7.80 a pound. How much *Fudge Fantasy* will they need?
- a. 22 pounds b. 25 pounds c. 28 pounds d. 72 pounds e. 100 pounds
35. A line goes through $(-2,1)$ with slope $\frac{3}{5}$. Which of the following is its equation?
- a. $-2x + 1y = \frac{3}{5}$ b. $3x - 5y = -11$ c. $3x - 5y = -3$ d. $3x + 5y = -1$ e. $5x + 3y = 2$
36. Agnes has 45% more books than Charlie has. If we let T be the number of books Charlie has, which of these would represent their total number of books?
- a. $.45T$ b. $1.45T$ c. $T + .45T$ d. $T + 1.45T$ e. $T + 2.45T$
37. A well-digging company charges \$45 per foot of depth, plus a flat rate of \$1200.00, to dig a well. If we let d be the number of feet deep they have to dig, then which expression would represent the total cost to dig a well?
- a. $1200 + 45 + d$ b. $1200 + 45d$ c. $(1200 + d)45$ d. $(45 + d) + 1200$ e. $(45 + d)1200$
38. If you solve the formula $\frac{2\pi}{k} = 3h^2$ for k , the result is
- a. $6\pi h^2 = k$ b. $k = \frac{3h^2}{2\pi}$ c. $k = \frac{2\pi}{3h^2}$ d. $k = 2\pi = 3h^2$ e. $k = \frac{1}{6\pi h^2}$
39. Solve the formula $v = \frac{1}{3}\pi r^2 h$ for h .
- a. $h = \frac{1}{3}\pi r^2 v$ b. $h = \frac{v}{3\pi r^2}$ c. $h = 3\pi r^2 v$ d. $h = \frac{3v}{\pi r^2}$ e. $h = v - \frac{1}{3}\pi r^2$

40. Solve $7 + 3x < 3 + 5x$
- a. $x > 2$ b. $x < 2$ c. $10x < 8x$ d. $x < \frac{1}{2}$ e. $x < -2$
41. A map's scale is illegible. However, we know that Coinjock and Cummock are really 152 miles apart, and on the map they are separated by 4.75 inches. This tells us the map scale must be 1 inch = ? miles:
- a. 1 inch = 9.5 miles b. 1 inch = 8 miles c. 1 inch = 16 miles
d. 1 inch = 19 miles e. 1 inch = 32 miles
42. A line passes through $(-4, 7)$ and $(-2, -10)$. What is its slope?
- a. $-\frac{17}{2}$ b. $-\frac{1}{2}$ c. $\frac{2}{17}$ d. $\frac{-2}{17}$ e. 2
43. Sally's Sweet Shop will sell you 15 champagne truffles and 25 toffee kisses for \$49.25, or you can get 9 champagne truffles and 12 toffee kisses for \$27.15. How much is a single champagne truffle?
- a. \$.80 b. \$1.60 c. \$1.95 d. \$2.75 e. \$3.08
44. Al and Bob both rent canoes. Al paddles downstream with the current, while Bob paddles upstream against the current. They have been training together, so they know they both paddle at the same speed, but the current makes a difference: After an hour, Al has gone 10 miles downstream but Bob has only gone 2 miles upstream. Find the speed they paddle.
- a. 2 mph b. 4 mph c. 6 mph d. 8 mph e. 10 mph
45. Two trains start from towns 300 miles apart and travel towards each other. After 3 hours, they pass each other (they would have met and crashed but fortunately they were on different tracks by then!). The eastbound train averaged 30 mph faster than the westbound train. Find the speed of the slower (westbound) train.
- a. 35 mph b. 50 mph c. 65 mph d. 85.5 mph e. 100 mph
46. It takes a boat 1.5 hours to go 12 miles downstream, but 6 hours to get back coming upstream against the current. Find the speed of the current.
- a. 2 mph b. 3 mph c. 5 mph d. 8 mph e. 3.2 mph
47. Convert $7x = 3y - 2$ to slope-intercept form.
- a. $x = \frac{3}{7}y - \frac{2}{7}$ b. $y = \frac{7}{3}x - 2$ c. $y = \frac{3}{7}x + 2$ d. $y = \frac{7}{3}x + \frac{2}{3}$ e. $y = \frac{9}{3}x$