Math 1050 **FINAL EXAM** **Version B**

December 11, 2014

Your Name: _____

Instructor's Name: _____

Signature: _____

Circle the **time** your class meets: OSU email: _____@osu.edu

8:00a.m. **9: 10** **10:20** **11: 30** **12:40** **1:50** **3:00** **4:10** **5:30** **7:05p.m.**

Directions: You have 115 minutes to complete this exam. There are 35 questions. Each multiple choice question is worth 5 points, each of the other questions is worth 6 points. (There is no partial credit on multiple choice questions. Partial credit is rare but possible; so please show your work. Write your answers clearly, and use the space provided for the answer!

For problems 1 - 10, write the **letter** of the correct answer in the space provided. Only one answer is correct.

1. Subtract.
   $(4r^3 + 2r^2 + 6) - (-r^2 + 3r - 2)$
   A) $5r^3 - r + 8$ B) $5r^3 - r^2 + 8$ C) $4r^3 + 3r^2 - 3r + 4$ D) $4r^3 + 3r^2 - 3r + 8$ E) $4r^3 + 3r^2 + 3r + 4$

2. Factor: $81y^2 + 36yz + 4z^2$.
   A) Nonfactorable over the integers
   B) $(9y - 2z)^2$
   C) $(9y + 2z)^2$
   D) $(2z + 9y)(2z - 9y)$
   E) $(9y + 2z)(9y - 2z)$

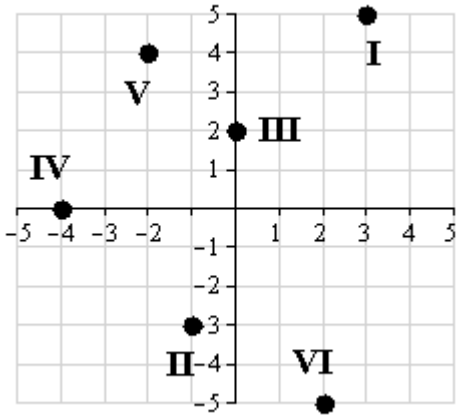
3. Write $5\frac{7}{9}\%$ as a fraction.

   A) $\frac{19}{450}$ B) $\frac{13}{25}$ C) $\frac{1}{20}$ D) $\frac{13}{225}$ E) $\frac{52}{9}$

4. Simplify: $\frac{3n^{-4}y^{-2}}{10n^6y^9}$.

   A) $\frac{3}{10n^{24}y^{18}}$ B) $\frac{3}{10n^2y^7}$ C) $\frac{3}{10}n^{10}y^{11}$ D) $\frac{3}{10n^{10}y^{11}}$ E) $\frac{3y^{11}}{10n^{10}}$

5. Find the coordinates of the point labeled **VI**.



A) $(0,2)$ B) $(2,-5)$ C) $(-1,-3)$ D) $(-4,0)$ E) $(3,5)$

6. Write the mass of Venus, which is approximately 4,870,000,000,000,000,000,000,000 kg, in scientific notation.

A) 4.87×10^{22} B) 4.87×10^{25} C) 4.87×10^{23} D) 4.87×10^{26} E) 4.87×10^{24}

7. Multiply: $(x^2-9x+4)(x-2)$.

A) $x^3-11x^2+22x-8$
B) $x^3-7x^2+22x-8$
C) $x^3-18x^2+13x-8$
D) $x^3-11x^2+18x-8$
E) $x^3-7x^2+22x+2$

8. Solve: $\frac{3}{7}x+5=4$.

A) $-3\frac{1}{3}$ B) $-3\frac{1}{6}$ C) $-2\frac{1}{3}$ D) $-2\frac{1}{6}$ E) $-1\frac{1}{6}$

9. A shipping supervisor bought 36 stamps for \$9.60. The purchase included 30¢ stamps and 24¢ stamps. How many of each type of stamp were bought?

A) sixteen 30¢ stamps; twenty 24¢ stamps
B) twenty 30¢ stamps; fifteen 24¢ stamps
C) thirteen 30¢ stamps; twenty-three 24¢ stamps
D) twenty 30¢ stamps; sixteen 24¢ stamps
E) twelve 30¢ stamps; twenty-five 24¢ stamps

10. Factor: $25x^2-9y^2$.

A) $(3y+5x)(3y-5x)$
B) Nonfactorable over the integers
C) $(5x-3y)^2$
D) $(5x+3y)(5x-3y)$
E) $(5x+3y)^2$

11. Find the greatest common factor.

    $4p^3q^4$, $28pq^3$, $36q^5$

12. Solve: $6x + 7 > 11x - 8$.

13. Evaluate the following expression using the Order of Operations Agreement.

    $-13^2 + 4\left[6 \div (6 - 4)\right]$

14. Ralph's Roof Repair charged $380 for patching a damaged roof. The charge included $280 for the replacement shingles and $20 per hour for labor. How many hours of labor were required for the job?

15. Find the circumference of a circle with a radius of 6 cm. Use 3.14 for π.

16. Multiply: $(4p-7)^2$.

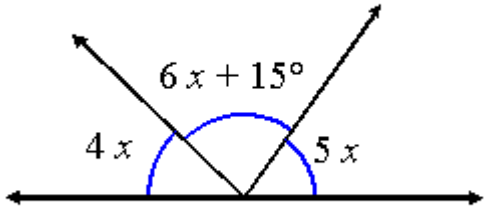
17. A biker left Lewiston Wednesday morning for a 215 mile, 5-hour trip. For the first part of the trip, the motorcycle's average speed was 40 mph. For the remainder of the trip, the average speed was 55 mph. How long did the biker ride at each speed?

18. Solve by the addition method:

$$\begin{aligned} 5x &- 5y = -35 \\ 4x &+ 3y = -7 \end{aligned}$$

19. Factor: $9c^2 + 6cx - 15c - 10x$.

20. Compute x.



21. The manager of a discount clothing store received two shipments of fall clothing. The cost of the first shipment, which contained 25 identical shirts and 35 identical coats, was $3125. The second shipment, at the same prices, contained 30 of the same shirts and 25 of the same coats. The cost of the second shipment was $2900. Find the cost of one coat.

22. The length of a rectangle is 5 in. more than twice its width. Its area is 207 in^2. Find the length of the rectangle.

23. Rowing with the current, a canoeist paddled 15 mi in 3 h. Against the current, the canoeist could paddle only 9 mi in the same amount of time.

    Find the rate of the canoeist in calm water and the rate of the current.

24. 8 is 40% of what?

25. Simplify the following expression: $-\frac{5}{8}-\left(-\frac{2}{5}\right)+\frac{1}{2}$.

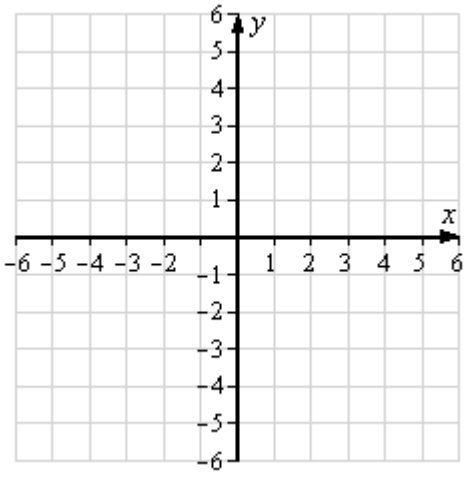
26. A tea extract that is 24% green tea is mixed with an extract that is 12% green tea.

    How many gallons of the 12% green tea extract are used to make 10 gallons of an energy drink that is 18% green tea?

27. A stock analyst deposited a total of $90,000 in two simple interest accounts. The annual simple interest rate on one account is 4%. The annual simple interest rate on the second account is 13%. How much was invested in each account if the total annual interest earned is 7% of the total investment?

28. Graph the solution set.

$x + 2y < 4$



29. The price of a canoe at the Whitewater Boats Shop is $324. This price includes the store's cost for the canoe plus a markup at the rate of 20%. Find Whitewater's cost for the canoe.

30. Find the equation of the line that passes through the points (1, 2) and (6, –13).

31. Factor: $8y^4 - 88y^3 + 192y^2$.

32. Solve by substitution:

$$y = 5x + 12$$
$$y = 3x + 8$$

33. Factor: $2c^2 - 7c - 15$.

34. Solve: $x^2 - 14x + 40 = 0$.

35. Divide: $\left(2y^2 - 3y - 13\right) \div \left(y - 4\right)$.

Answer Key

1. D
   Grading: (5p) No partial credit.
   :
2. C
   Grading: (5p) No partial credit.
3. D
   Grading: (5p) No partial credit.
4. D
   Grading: (5p) No partial credit.
5. B
   Grading: (5p) No partial credit.
6. E
   Grading: (5p) No partial credit.
7. A
   Grading: (5p) No partial credit.
8. C
   Grading: (5p) No partial credit.
9. A
   Grading: (5p) No partial credit.
10. D
    Grading: (5p) No partial credit.

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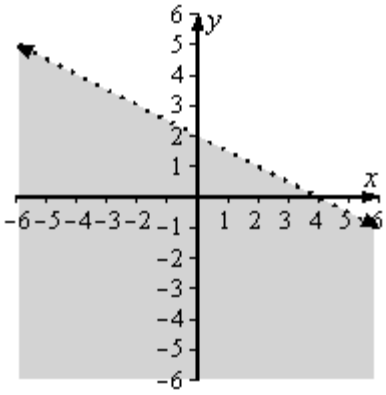
11.	$4q^3$	(6p) 2 points for correct coefficient. 2 points for correct power of each variable.
12.	$x < 3$	(6p) 3 points for exactly one computational mistake, no points thereafter.
13.	–157	(6p) 3 points for exactly one computation mistake, no points for two or more. No credit if Order of Operations is violated at any point.
14.	5 h	(6p) 3 points for correct equation; 1 point for exactly one mistake. 3 points for correct solution of proposed equation, even if equation is incorrect; 1 point for exactly one mistake. Unit (h) needs not be shown.
15.	37.68 cm	(6p) 4 points for correct formula, but exactly one computation mistake (allow for minor rounding errors). 2 points for incorrect formula (e.g. computation of area instead, or missing the 2), but correct computation afterward. No points for any other situations. Unit (cm) needs not be shown.

16.	$16p^2 - 56p + 49$	(6p) 2 points for each correct term (including sign of term).
17.	4 hr at 40 mph; 1 hr at 55 mph	(6p) 3 points for correct equation/setup. 1 point for correct solving of proposed equation, even if equation is incorrect; 1 point for each solution presented. Unit (h) needs not be shown.
18.	(–4, 3)	(6p) 4 points for exactly one computational mistake; 2 points for exactly two, no points thereafter. 2 points off if only one variable is given at the end.
19.	$(3c + 2x)(3c - 5)$	(6p) 3 points for correct grouping. 2 points for correct factorization of each group, respectively (1 point per group). 1 more point for correct final answer.
20.	11°	(6p) 3 points for correct equation. 3 points for correct solution of proposed equation, even if equation is incorrect. Unit (°) needs not be shown.
21.	$50.00	(6p) 3 points for correct system of equations; 1 point for exactly one mistake, no points for two or more. 3 points for correct solution of proposed equation, even if either equation is incorrect. Take 1 points off if only the wrong variable is computed. Unit ($) needs not be shown.
22.	23 in.	(6p) 3 points for correct equation. 3 points for correct solution of proposed equation, even if equation is incorrect. Unit (in) needs not be shown.

23.	Canoeist = 4 mph; current = 1 mph	(6p) 3 points for correct system of equations; 1 point for exactly one mistake, no points for two or more. 3 points for correct solution of proposed equation, even if either equation is incorrect. Take 2 points off if only one variable is presented at the end. Unit (mph) needs not be shown.
24.	20	(6p) 3 points for exactly one computational mistake, no points thereafter.
25.	$\frac{11}{40}$	(6p) 4 points for exactly one computation mistake; 2 points for exactly two; no points thereafter. Wrong addition of fractions at any point (e.g. adding denominators), no credit.
26.	5 gal	(6p) 3 points for correct equation/setup; 1 point for exactly one mistake.3 points for correct solution of proposed setup, even if setup is incorrect; 1 point for exactly one computational mistake. Unit (lbs) needs not be shown.
27.	\$60,000 at 4%; \$30,000 at 13%	(6p) 3 points for correct equation/setup; 1 point for exactly one mistake in setup. 3 points for correct solution of proposed equation, even if equation is incorrect; 1 point for exactly one computation mistake. 1 point off if only one amount is shown. Unit (\$) needs not be shown.

28. 

	(6p) 4 points for correct bordering line: 2 points for each correct intercept.1 point for correct choice of half-plane, 1 point for bordering line being either full or dotted, depending on the problem.

29.	\$270	(6p) 3 points for exactly one computational mistake, no points thereafter. Unit (\$) needs not be shown.
30.	$y = -3x + 5$	(6p) 3 points for correct slope. 3 points for correct point-slope formula. Note: line equation needs not be simplified or brought to slope-intercept form.
31.	$8y^2(y-8)(y-3)$	(6p) 1 points for correct numeric common factor. 1 points for correct variable common factor. 4 points for correct factorization of remaining terms; 2 points if the factorization is incorrect, but the constants either add or multiply (but not both, since it is an incorrect answer) to correct, appropriate coefficients; no points for any other mistakes (e.g. one factor is actually correct, but the other is not).
32.	(–2, 2)	(6p) 2 points for correct equation obtained by substituting first equation in the second. 2 points for correct solution of the equation, even if the equation is wrong. 2 points for computing the substituted variable. (No partial credit at any step).
33.	$(c-5)(2c+3)$	(6p) 4 points for exactly one mistake, 2 points for exactly two, no points thereafter. Guessing the coefficients is certainly allowed; if incorrect numbers are used, but at least two operations give correct answers (e.g. multiplication of initial terms and of final terms gives correct first and last term in problem's polynomial), 2 points.
34.	4, 10	(6p) 2 points for correct factorization of the polynomial. 2 points for each correct solution based on the factorization obtained in step 1, even if it is incorrect.

35.	$2y+5+\frac{7}{y-4}$	(6p) 4 points for exactly one mistake, 2 points for exactly two, no points thereafter. Allow remainder be written separately (not as numerator in the fraction with divider as denominator).