

MTH 28.5, Midterm extra Name (first, last):

If you got an F or a D on the midterm then you can work on this new exam to improve your grade, (F to D or D to C). Some of these questions will also be on the final exam.

Print out this exam (**it must be printed**). Follow the steps provided for each question, show all your work in the space provided, and make sure you get the correct answer if it is shown. Let me know if you have any questions or try the tutoring lab for help. Then bring this completed exam and your original midterm to my office hours and I will ask you a few questions to check you understand your solutions.

Q1. Evaluate $8x - 2y - 5$ when $x = -4$ and $y = -7$.

Method: Substitute and work out carefully using the correct order of operations. Show all your steps.

Answer: -23

Q2. Find: $\frac{3}{4} - \frac{1}{6} \div \frac{1}{2}$

Method: In the correct order of operations division comes before subtraction, so divide first. Then do the subtraction – needs a common denominator.

Answer: $\frac{5}{12}$

Q3. Solve: $7(2m - 4) - 3 = 4m - 1$

Method: Distribute the 7 and combine like terms on the left. Isolate the m s on the left and just numbers on the right.

Answer: $m = 3$

Q4. Solve this formula for h : $A = \frac{1}{8}b^2h$

Method: Multiply both sides by 8 to remove the fraction. To isolate h then divide both sides by b^2 .

Answer: $h = \frac{8A}{b^2}$

Q5. Solve this inequality and write the solution in interval notation: $x - 4(x + 1) < 8$

Method: Distribute the -4 and combine like terms on the left. Then move all the numbers to the right. Divide both sides by the number multiplying x . If you're dividing by a negative you must switch the inequality. You can then graph the solutions on the number line and write them in interval notation.

Answer: $x > -4$ and $(-4, \infty)$

Q6. Draw a careful graph of the line $2x + 3y = -12$ showing where it crosses both axes. (Points deducted if not neat, clear, labelled and accurate.)

Method: To find the y -intercept, where the line crosses the y axis, substitute $x = 0$ and solve for y . Plot this point on the y axis. To find the x -intercept, where the line crosses the x axis, substitute $y = 0$ and solve for x . Plot this point on the x axis. Draw the straight line that goes through these two points.

Q7. The function f is given by $f(x) = \frac{3x - 2}{x + 4}$.

(a) Evaluate and simplify $f(0)$ (so substitute $x = 0$)

(b) Evaluate and simplify $f(3)$

(c) Evaluate and simplify $f(-5)$

Answers: $-\frac{1}{2}, 1, 17$

Q8. Subtract: $(x^2 - 4x + 5) - (2x^2 - 7x + 3)$

Answer: $-x^2 + 3x + 2$

Q9. Simplify: $\frac{(2xy)^5(3x^2)^3}{12x^3y}$

Method: Work on the top first, using the rules for exponents. Have $(2xy)^5 = 2^5x^5y^5$. Similarly in the second factor. Use that $(x^m)^n = x^{mn}$. In the last step use $\frac{x^m}{x^n} = x^{m-n}$.

Answer: $72x^8y^4$

Q10. Multiply: $(4x - 3)(2x + 9)$

Method: FOIL. Don't forget that x times x is x^2 !

Answer: $8x^2 + 30x - 27$

Q11. Perform the operation $(2x^2 - 5x - 30) \div (x + 3)$ and give the quotient and the remainder.

Method: Set up the long division. Compare $2x^2$ and x first. We have that x goes into $2x^2$ $2x$ times. So write $2x$ above $-5x$ and then multiply $2x$ by $x + 3$. Then subtract that from $2x^2 - 5x - 30$. You should have $-11x - 30$ left. Repeat this step once more to get the answer. (See your notes or the textbook for more details.)

Answer: quotient is $2x - 11$ and remainder is 3.

Q12. Use the GCF to factor the expression: $15x^4y - 12x^2y^2$

Method: Find all the factors that these two terms have in common. From the numbers we see they both contain a 3. They also have x^2 and y in common. These give the GCF which is the first factor. To see the second factor, divide each term by the GCF.