

1. $3x^5 - 7x^4 + x - 21$
Name the coefficients:
Name the constants:
-

2. $f(x) = -\frac{1}{4}x + 3$
What is the domain?
What is the range?
-

3. Given the length and width (length,width): (10, 8.6), (11, 8), (13, 8.4), (12, 8)
A. The relation is not a function because one width matches more than one length.
B. The relation is not a function because one length matches more than one width.
C. The relation is a function because every length matches to exactly one width.
D. The relation is a function because every width matches to exactly one length
-

4. Which have equivalent solutions?

EQ#1: $\frac{x}{3} + \frac{4}{5} = \frac{8x}{15}$ EQ#2: $-16(x - 4) = -9(2x - 8)$ EQ#3: $10x + 20 - 7x = 8$

- A. EQ #1 & #2 B. EQ #2 & #3 C. EQ #1 & #3 D. All of them E. None of them
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5. You invest %100 with an annual growth rate of 44%. Write an expression that shows the exponential formula for the amount of money after t years, based on the approximate monthly growth rate.

Not on Midterm

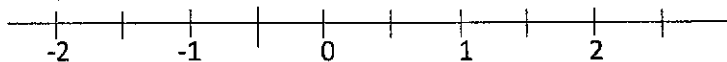
6. Simplify: $(2.8)^x \cdot (2.8)^5$

- A. $(2.8)^{5x}$ B. $(2.8)^{x-5}$ C. $(2.8)^{x^5}$ D. $(2.8)^{x+5}$
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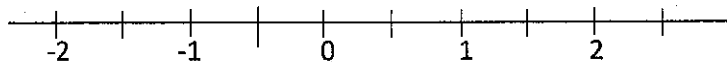
7. The school is selling tickets to the play. They only have 300 seats. They sell adult tickets for \$3 each and student tickets for \$2 each. They want to raise at least \$900. Write a system of inequalities to represent this situation.

8. Graph

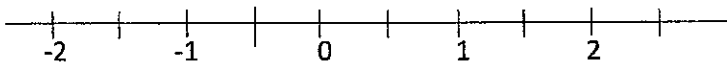
A. $2x - 4 < 1$



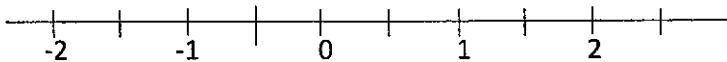
B. $4 - 2x > 1$



C. $6 - 2x < 1$



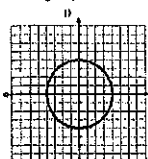
D. $2x + 6 > 6$



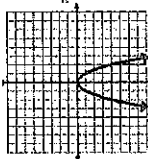
Topic #1: Coefficients and Constants
 Coefficient: number attached to a variable.
 Constant: number with no variable attached.
 Ex 1: $4x^2 - x + 2$ ex 2: $x^3 + 5x$
 Coefficients: 4, -1 constant: 2 coefficients: 1, 5 constant: 0

Practice: name the coefficients and the constant:
 1. $7 - 3x^2 + x$ 2. $x^4 - x$
 Coefficients: _____
 Constant _____

Topic #2: Domain and Range **use inequality notation** least to greatest!
 Domain: x values
 Range: y values



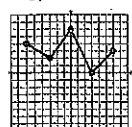
Domain _____
Range _____



Domain _____
Range _____

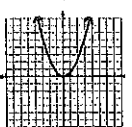
Practice

3.



Domain _____
Range _____

4.



Domain _____
Range _____

Topic #4: Direct Variation: a linear equation with a y-intercept of 0.
 $y = kx$, or $k = \frac{y}{x}$ (**direct** - divide y by x)
 Ex 5 Solve for x: (x, 15) (8, 20) ex 6 write an equation:

X	-6	-5	-1	2
Y	54	45	9	-18

9. Solve for x: (-5, 32) (x, -50) 10. Write an equation:

X	-4	-2	2	4
Y	-28	-14	14	28

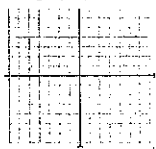
Topic #5: Inverse Variation: A rational function, x and y cannot = 0
 $Y = \frac{k}{x}$ or $xy = k$ (**inverse** - multiply y by x)
 Ex 7: Solve for x: (5, 6) (x, -10) Ex 8: write an equation:

X	-4	-2	2	4
Y	8	16	-16	-8


11. Solve for y: (6, y) (4, -15) 12. Write an equation:

X	-4	-2	2	4
Y	20	40	-40	-20

Topic #3: Absolute Value graphs and critical numbers
 $y = a|x - h| + k$ a = slope of the right side, inside abs. value is a left/right slide and opposite of what you would think, k is an up/down slide.
 Ex #3: graph $y = |x + 2| - 1$ Ex #4 graph $y = -|x - 3| + 2$



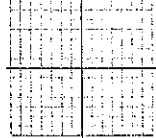
Max/min _____
Domain _____
Range _____



Max/min _____
Domain _____
Range _____

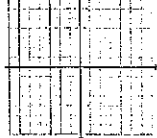
Practice:

5. $y = -|x + 1| + 3$



Max/min _____
Domain _____
Range _____

6. $y = |x - 2| - 4$



Max/min _____
Domain _____
Range _____

Without graphing, state the max/min, domain, range

7. $y = |x + \frac{3}{5}| - \frac{2}{3}$

Max/min _____
Domain _____
Range _____

8. $y = |x - 1.45| + 7.32$

Max/min _____
Domain _____
Range _____

Topic #6: Solving an absolute value equation OR inequality

- Address any outside the symbol constants or coefficients
- Take the absolute value - split into two equations, one the same and one the opposite sign. If an inequality: *for the opposite sign, remember to reverse the inequality. Write your answer as a conjunction or disjunction.

Ex 9: $-3 - |x + 5| = -10$ Ex 10: $4|x - 4| > 32$

13. $-2|x + 5| - 6 = -30$ 14. $|x + 3| - 4 = 10$

15. $-3|x - 7| \geq -12$ 16. $|x + 8| > -2$

Topic #7 solving systems of linear and absolute value

- Set the equations equal to each other. On the abs value side remove any outside constants or coefficients.
- Take the absolute value. For the second equation make sure to take the opposite of both terms.
- Plug your x value in to both equations to get your y value. You must plug it in to both equations to verify it is a real, and not extraneous, solution.

Example 11: $\begin{cases} f(x) = 5x - 4 \\ g(x) = |3x + 8| \end{cases}$

17. $\begin{cases} f(x) = -3x + 5 \\ g(x) = |x - 3| \end{cases}$

Topic #8 parallel/perpendicular/neither #solutions * must solve for y!!!

Parallel lines have the same slope and different y-intercepts. They will never intersect, therefore have no solutions

Perpendicular lines have opposite reciprocal slopes. They intersect at 90 degree angles, therefore have one solution.

Coincident lines have the same slope and the same y-intercept. They are the same line! Therefore they have infinitely many solutions.

Lines that are not parallel nor perpendicular will intersect once.

State parallel, perpendicular, neither, or coincident. State the number of solutions.

Ex 12 $y = 3x - 2$ $x + 3y = 15$

Ex 13: $y = -x + 8$ $5y + 5x = 40$

18. $y = \frac{1}{4}x - 6$ $8x + 2y = -12$

19. $y = 3x + 5$ $y = -3x - 9$

Topic #9 Rate, time, distance problems Rate * Time = Distance

EX 14: Ethan rides his bike 3 miles per hour faster than Evan. After they ride their bikes for 5 hours in opposite directions they are 53 miles apart. Find the rate for each boy.

EX 15: Ethan rides his bike at 7 mph. Evan rides his bike at 9 mph. They go for a bike ride, but Evan left one hour after Ethan. How long will it take for him to catch up to Ethan?

20. A van and a motorcycle leave a house at the same time but travel in opposite directions. The van travels 10 mph slower than the motorcycle. After 3 hours they are 390 miles apart. Find the rate of each vehicle.

21. A van leaves a house and travels at 45 mph. A motorcycle leaves 3 hours later and travels at 50 mph. when will the motorcycle catch up with the van?