

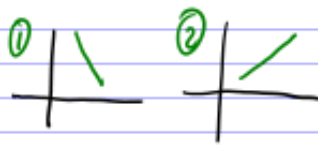
Panel 1

Math 1303, Last time:

Odd/even functions

Algebra with functions $\frac{f(x+h)-f(x)}{h}$

Shifting up/down/right/left

Supply/demand curves 

Linear functions

1

Panel 2

Ex: Which of the following functions are

(a) even (b) odd (c) neither

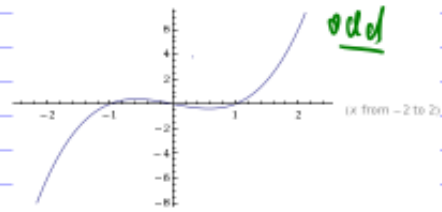
① $f(x) = x^5 - 7x^3 + 2x$ $h(x) = x^3 + x^2 + x + 1$

② $g(x) = 3x^4 + 5x^2 + 7$ $h(-x) = -x^3 + x^2 - x + 1$

③ $h(x) = \frac{x^3 - 2x}{x^4 + 1}$ $h(-x) = \frac{(-x)^3 - 2(-x)}{(-x)^4 + 1} =$

$\frac{-x^3 + 2x}{x^4 + 1} =$

$-\frac{(x^3 - 2x)}{x^4 + 1} = -h(x)$

④  odd

2

Panel 3

$$\begin{aligned}
 \underline{14x^3 - 7x - 21} &= 7(2x^3 - x - 3) \\
 &= 8 \left(\frac{14}{8}x^3 - \frac{7}{8}x - \frac{21}{8} \right) \\
 &= -(-14x^3 + 7x + 21)
 \end{aligned}$$

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Panel 4

Quiz #1

Name: _____

① Are the following functions even, odd, or neither:

a) $f(x) = 3x^3 - 4x$

b)



② If $f(x) = \frac{4}{x^2 - 3x}$, find the domain of f

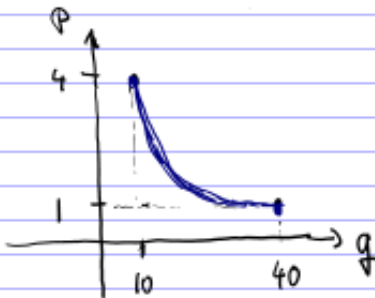
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Panel 5

③ If $f(x) = x^2 - 1$ and $g(x) = 2x + 1$, a) find $\frac{g(2+h) - g(2)}{h}$

b) $(f \circ g)(x) = f(g(x))$

④ This graph shows price p as a function of quantity q .
a) Is it a supply or demand curve?

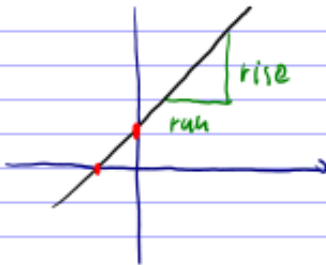


b) What is the range of $p(q)$?

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Panel 6

Review of Lines



slope $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$

slope-intercept: $y = mx + b$

point-slope: $y - y_1 = m(x - x_1)$

y-intercept: set $x=0$ at most one, easy
x-intercept: set $y=0$ many possible, hard

Two lines are parallel if: slopes $m_1 = m_2$

Two lines are perpendicular if: slopes $m_1 = -1/m_2$

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Panel 7

Ex: Find equation of line with slope 2 through $(1, -3)$

$$y + 3 = 2(x - 1)$$

Ex: Find equation of line through $(-3, 8)$ and $(4, -2)$

$$y - 8 = -\frac{10}{7}(x + 3)$$

$$m = \frac{8 - (-2)}{-3 - 4} = -\frac{10}{7}$$

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Panel 8

Ex: Sketch $2x - 3y + 6 = 0$

① Solve for y : $-3y = -2x - 6 \quad [\cdot (-1/3)]$
 $y = \frac{2}{3}x + 2$



same



②

x	y
0	2 \Rightarrow y-int
-3	0 \Rightarrow x-int

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Panel 9

Ex: Find the equation of 2 lines: Both should pass through $(3, -2)$, the first is perpendicular, the second parallel to $y = 3x$

homing (HW)

Ex: Are these lines (A) Parallel (B) Perpend. (C) Neither

$$y - 5 = 2x - 2 \quad m = 2 \quad \text{perp}$$

$$6y + 3x = 5 \quad m = -\frac{1}{2}$$

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Panel 10

Ex: Suppose the demand per week for a product is 100 units when the price is \$58 and 200, at \$51 each. Find the demand equation assuming it is linear.

Q	P
100	58
200	51

$$P = P(Q)$$

$$P - 51 = -\frac{7}{100}(Q - 200)$$

$$m = \frac{58 - 51}{100 - 200} = -\frac{7}{100}$$

$$P = -\frac{7}{100}(Q - 200) + 51$$

$$P = -\frac{7}{100}Q + 14 + 51 = -\frac{7}{100}Q + 65$$

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Panel 11

Ex In testing an experimental diet for lems it turns out that the weight depends linearly on the number of days since the diet began, where $0 \leq d \leq 50$. Suppose the initial weight was 40 gr, 25 days later it was 67.5 gr. What is the weight at day 50?

d	w	$w = w(d)$
0	40	
25	67.5	

→ find equation and substitute $d=50$

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Panel 12

Systems of Equations

Want to setup production schedule for 2 models of a new product.

Model A: 4 resistors, 9 transistors

Model B: 7 resistors, 14 transistors

From supplier we can get 335 resistors and 850 transistors daily. How many model A, B to make?

$x = \#$ of model A

$y = \#$ of model B

resistors:	$\begin{cases} 4x + 7y = 335 \\ 9x + 14y = 850 \end{cases}$	system of equations
transistors:		

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Panel 13

2 Linear Equations:

$$4x + 5y = 335$$

$$9x + 14y = 850$$

one solution no solution infinitely many solutions

on 6/10

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Panel 14

Solving System of Equations

Ⓐ Elimination Method: pick one variable and get rid of it by add/subtracting equations

$$\begin{array}{rcl}
 4x + 5y = 335 & | \cdot 9 & 36x + 45y = 3015 \\
 9x + 14y = 850 & | \cdot 4 & - (36x + 56y = 3400) \\
 & & - \quad -11y = -385
 \end{array}$$

$$\underline{y = \frac{385}{11} = 35} \quad \text{plug in anywhere}$$

$$\underline{x = 40}$$

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Panel 15

Ex: Solve $3x - 4y = 13$

$$3y + 2x = 3$$

$$\begin{array}{r} \downarrow \\ 3x - 4y = 13 \quad | \cdot 2 \\ 2x + 3y = 3 \quad | \cdot (-3) \end{array} \quad \begin{array}{l} (6x - 8y = 26) \\ (-6x - 9y = -9) \end{array} \quad \oplus$$

$$-17y = 17$$

$$y = -1$$

$$3 \cdot (-1) + 2x = 3$$

$$\underline{\underline{x = 3}}$$

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Panel 16

⑧ Substitution Method: solve one equation for one variable and substitute into second equation

$$\begin{array}{l} x - 2y = 8 \\ 2x + 4y = 0 \end{array} \quad \Rightarrow \quad \begin{array}{l} x = 2y + 8 \\ 2(2y + 8) + 4y = 0 \\ 4y + 16 + 4y = 0 \\ 8y + 16 = 0 \end{array} \quad \Rightarrow \quad \begin{array}{l} y = -2 \\ x = -4 + 8 = 4 \end{array}$$

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Panel 17

$$\begin{array}{l} \textcircled{1} \quad 4x - 7y = 10 \\ \quad \quad 3x + 7y = 9 \end{array} \quad \text{elim.}$$

$$\begin{array}{l} \textcircled{2} \quad 3x - y = 9 \\ \quad \quad 2x + 6y = 7 \end{array} \quad \text{subst}$$

$$\begin{array}{l} \textcircled{3} \quad 7x + 3y = 1 \\ \quad \quad 5x + 2y = 3 \end{array} \quad \text{elim.}$$