

Written assignments  
to hand in.

Section 1.4 14, 24, 70

Due Wednesday 9/27

Handout on Linear

Systems

Due Monday 10/2

Discussion Problems

From the department syllabus  
These are not to hand in.

Section 1.4, Exam practice

WebAssign

Sections 1.3+1.4

Friday 9/28 at 9m

Exam Covering

sections P2-P8, 1.1-1.4

Friday 9/29

Calculators which are internet  
enabled (eg., mobile phones)  
and which can do symbolic  
manipulations are not allowed.  
See me if you are unsure  
about your calculator.

## Exam 1 Practice

P2, 49 [2, 8) Express using inequalities and graph it.

$$2 \leq x < 8$$



P3, 29 Simplify

$$a. (x^3 y^3)^{-1} = x^{-3} y^{-3} = \boxed{\frac{1}{x^3 y^3}}$$

$$b. (a^2 b^{-2})^{-3} (a^3)^{-2} = (a^2)^{-3} (b^{-2})^{-3} (a^3)^{-2} = a^{-6} b^6 a^{-6}$$

$$= a^{-12} b^6 = \boxed{\frac{b^6}{a^{12}}}$$

$$c. \left(\frac{x^2}{y^{-2}}\right)^{-2} \left(\frac{2y^{-3}}{x^2}\right)^3 = \frac{(x^2)^{-2}}{(y^{-2})^{-2}} \frac{2^3 (y^{-3})^3}{(x^2)^3} = \frac{x^{-4} 8 y^{-9}}{y^4 x^6}$$

$$= \frac{8}{y^4 y^9 x^6 x^4} = \boxed{\frac{8}{y^{13} x^{10}}}$$

P5,69 multiply and simplify.

$$\begin{aligned}(2x-5)(x^2-x+1) &= (2x)(x^2) + (2x)(-x) + (2x)(1) + (-5)x^2 + (-5)(-x) + (-5)(1) \\ &= 2x^3 - 2x^2 + 2x - 5x^2 + 5x - 5 \\ &= 2x^3 - 7x^2 + 7x - 5\end{aligned}$$

P6,49 Factor by grouping.

$$\begin{aligned}(5x^3+x^2) + (5x+1) &= \\ x^2(5x+1) + (5x+1) &= \\ (5x+1)(x^2+1)\end{aligned}$$

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$$\begin{aligned}(18x^3+9x^2) + (2x+1) &= \\ 9x^2(2x+1) + (2x+1) &= \\ (2x+1)(9x^2+1)\end{aligned}$$

Similar problem

$$\begin{aligned}18x^3+9x^2-2x-1 &= \\ (18x^3+9x^2) + (-2x-1) &= \\ 9x^2(2x+1) - (2x+1) &= \\ (2x+1)(9x^2-1) &= \\ (2x+1)(3x+1)(3x-1)\end{aligned}$$

(51)

Subtract/add and simplify the rational expressions.

$$\frac{2}{x+3} - \frac{1}{x^2+7x+12} = \frac{2}{x+3} - \frac{1}{(x+3)(x+4)} =$$

← LCD  
(x+3)(x+4)

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

$$= \frac{2(x+4) - 1}{(x+3)(x+4)} = \frac{2x+8-1}{(x+3)(x+4)} = \boxed{\frac{2x+7}{(x+3)(x+4)}}$$

(61)

Simplify nested fractions

$$\frac{\frac{a}{b}}{\frac{c}{d}} = \frac{a}{b} \frac{d}{c}$$

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

$$= \frac{x+3}{x+2} \frac{x+2}{x+1} = \frac{\cancel{(x+2)}(x+3)}{\cancel{(x+2)}(x+1)} = \boxed{\frac{x+3}{x+1}}$$

88/

(29) Solve the linear equation.

$$2(1-x) = 3(1+2x) + 5$$

$$2 - 2x = 3 + 6x + 5$$

$$2 - 2x = 8 + 6x$$

$$+2x \quad +2x$$

$$2 = 8 + 8x$$

$$-8 \quad -8$$

$$(-6 = 8x) \frac{1}{8}$$

$$-\frac{6}{8} = x$$

$$\boxed{-\frac{3}{4} = x}$$

(47)

Solve

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

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

LCD  
6(x+1)

$$6(x+1) \left( \frac{3}{x+1} - \frac{1}{2} = \frac{1}{3(x+1)} \right)$$

$$6(x+1) \frac{3}{x+1} - 3(x+1) \frac{1}{2} = 6(x+1) \frac{1}{3(x+1)}$$

$$18 - 3(x+1) = 2$$

$$18 - 3x - 3 = 2$$

$$15 - 3x = 2$$

$$-2 + 3x \quad -2 + 3x$$

$$13 = 3x$$

$$\frac{13}{3} = x$$

1.2  
Q2

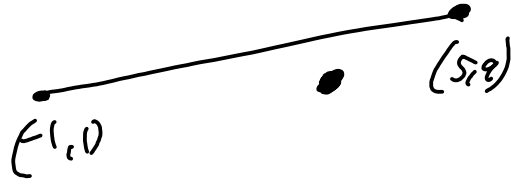
Find the center + radius of the circle.

$$(x-3)^2 + y^2 = 16$$

$$\text{center} = (3, 0)$$

$$\text{radius} = 4$$

(77) Find equation of circle with diameter



$$\begin{aligned} \text{center is midpoint of diameter} &= \left( \frac{-1+5}{2}, \frac{0+9}{2} \right) \\ &= (2, 5) \end{aligned}$$

$$\begin{aligned} \text{radius} &= \frac{1}{2} \text{ diameter} = \frac{1}{2} \sqrt{(5-(-1))^2 + (9-0)^2} \\ &= \frac{1}{2} \sqrt{36 + 81} = \frac{1}{2} \sqrt{117} = \frac{3\sqrt{13}}{2} \end{aligned}$$

$$\boxed{(x-2)^2 + (y-5)^2 = 25}$$

1.3/51 (a) Sketch the line with slope =  $\frac{3}{2}$  and point  $(-2, 1)$

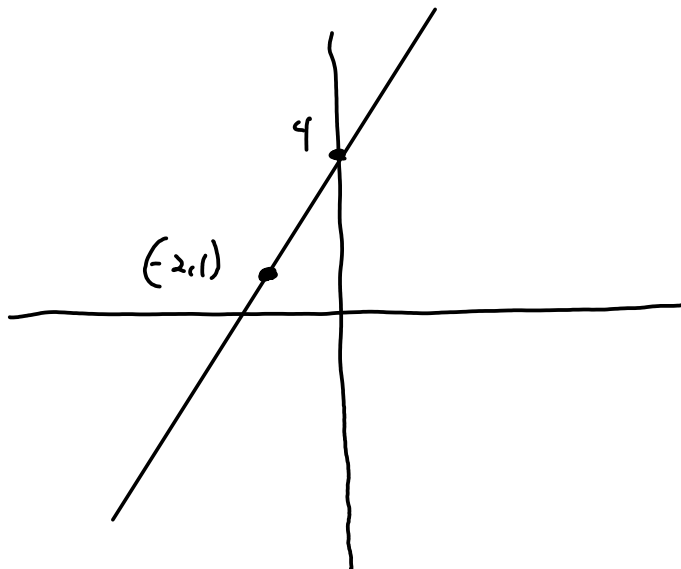
(b) Find the equation of the line.

(b)  $y - b = m(x - a)$

$$\boxed{y - 1 = \frac{3}{2}(x + 2)}$$

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

$$\boxed{y = \frac{3}{2}x + 4}$$



1.4/11 (a) solve by factoring.

$$2s^2 = 5s + 3$$

$$2s^2 - 5s - 3 = 0$$

$$(2s + 1)(s - 3) = 0$$

$$2s + 1 = 0 \text{ or } s - 3 = 0$$

$$\boxed{s = -\frac{1}{2} \quad | \quad s = 3}$$



23 Solve by completing the square

$$x^2 + 22x + 21 = 0$$

$$\begin{array}{r} x^2 + 22x = -21 \\ +121 \quad +121 \end{array}$$

$$\left(\frac{22}{2}\right)^2 = 11^2 = 121$$

$$x^2 + 22x + 121 = 100$$

$$(x + 11)^2 = 100$$

$$x + 11 = \pm \sqrt{100}$$

$$x + 11 = \pm 10$$

$$x = -11 \pm 10$$

$$x = -11 + 10 = -1 \quad \text{or} \quad x = -11 - 10 = -21$$