

Check yourself!

Week One:

Monday

Notes

(1) $+20 + -7 = +13$

unlike signs: subtract:
sign of the larger absolute value

(2) $-3\frac{1}{4} + 8\frac{7}{12} =$
 $\begin{array}{r} (+) 8\frac{7}{12} \\ (-) 3\frac{3}{12} \\ \hline 5\frac{4}{12} = 5\frac{1}{3} \end{array}$

common denominators!

(3) $23.1 - -16.09$
 $23.1 + 16.09$
 $\begin{array}{r} 23.1 \\ 16.09 \\ \hline 39.19 \end{array}$

change subtraction to addition
of the opposite
align decimals

(4) $-5.6 - 18.096$
 $-5.6 + -18.096$
 $\begin{array}{r} -5.6 \\ -18.096 \\ \hline -23.696 \end{array}$



(5) $17 - 51$
 $17 + -51 = -34$
 $\begin{array}{r} 17 \\ -51 \\ \hline -34 \end{array}$

(6) $-7/8 (6/7)$
 $\begin{array}{r} -\cancel{7}^1 \cdot \frac{6^3}{\cancel{8}_4 \cdot \cancel{7}_1} = -\frac{3}{4} \end{array}$

use cancellation
watch signs!

⑦ $-16.5(8.2)$

$$\begin{array}{r} -16.5 \\ \times 8.2 \\ \hline 330 \\ 13200 \\ \hline -135.30 = -135.3 \end{array}$$

right end alignment
watch signs
"count" decimal places in answer

⑧ $-40.5 \div -0.05 = +810$

$$\begin{array}{r} 810. \\ 0.05 \overline{)40.50} \end{array}$$

consider signs
move decimal to right end
in divisor, move the same
number of places in the
dividend, place in quotient.
divide: add zeros, if
necessary.

⑨ $\frac{6}{25} \div \frac{-18}{35} = -\frac{7}{15}$

$$\frac{16}{25} \cdot \frac{-35}{18} = \frac{7}{15}$$

multiply by the reciprocal.
"copy-change-flip"
watch signs
use cancellation

⑩ $-2\frac{1}{3} \div -3\frac{3}{4} = +\frac{28}{45}$

$$-\frac{7}{3} \cdot \frac{-4}{15} = \frac{28}{45}$$

change to improper fractions
change to reciprocal of
2nd no: cancellation:
answer

Wednesday

Notes

① $5\% = \frac{5}{100} = \frac{1}{20}$

drop "%" and put 100 as
denominator: simplify

$$\textcircled{2} \frac{\%}{100} = \frac{\text{part}}{\text{whole}}$$

③ 15% of 60 is what?

$$\frac{15}{100} = \frac{x}{60} \quad \left. \vphantom{\frac{15}{100}} \right\} \text{proportion}$$

$$\frac{800}{100} = \frac{100x}{100}$$

$$8 = x$$

part = "is" whole = "of"

$$\frac{15}{100} \times 60 = \frac{800}{800}$$

equation =

$$0.15(60) = x$$

$$8.00 = x$$

$$8 = x$$

change %
to decimal.

④ 36 is what percent of 24?

$$\frac{x}{100} = \frac{36}{24}$$

$$24x = 3600$$

$$24 \quad 24$$

$$x = 150\%$$

$$\begin{array}{r} 150 \\ 24 \overline{) 3600} \\ \underline{-24} \\ 120 \\ \underline{-120} \\ 0 \end{array}$$

proportion

equation:

"translate"

$$36 = n \cdot 24$$

$$24 \quad 24$$

$$1.5 = n$$

more dec. 2 places to
the right for percent 150%

⑤ $\frac{36}{40} = \text{ratio}$ correct
total

$$\frac{x}{100} = \frac{36}{40}$$

$$40x = 3600$$

$$40 \quad 40$$

$$x = 90\%$$

set ratio equal
to $\frac{x}{100}$ to find
percent

⑥ $A = s^2 \quad P = 4s \quad s = 7.5m$
 $A = (7.5)^2 \quad P = 4(7.5)$
 $A = 56.25m^2 \quad P = 30m$

$$\begin{array}{r} 7.5 \\ 7.5 \\ \hline 375 \\ 5250 \\ \hline 56.25 \end{array}$$

$$\begin{array}{r} 7.5 \\ \times 4 \\ \hline 30.0 \end{array}$$

⑦ $A = lw$

$$\frac{210}{15} = \frac{l \cdot 15}{15}$$

$$14 \text{ cm} = l$$

$$\begin{array}{r} 14 \\ 15 \overline{) 210} \\ \underline{15} \\ 60 \\ \underline{60} \\ 0 \end{array}$$

Fill in the parts of the equation you know and solve for the missing value.

⑧ $V = Bh$

$$V = (lw)h$$

$$V = (12 \cdot 5)6$$

$$V = (60)6$$

$$V = 360 \text{ m}^3$$

B = area of base

B = rectangle

Volume is measured in cubic units

⑨

52

53

53

53

55

55

57

$$57 - 52 = 5$$

→ range: difference between highest and lowest

53

→ mode: number that occurs most often

←

53

→

median: number in middle

(or average of the two values if there is an even number of data bits)

378 sum

$$\begin{array}{r} 54 \\ 7 \overline{) 378} \\ \underline{35} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

→ mean: sum of all data divided by number of pieces of data.

⑩

$$P = s_1 + s_2 + s_3$$

$$P = 6 + 3.5 + 4$$

$$P = 13.5 \text{ m}$$

Perimeter is the total of all side lengths

Friday

Notes

① $\pm 5, \pm 11, \pm \frac{5}{8}, \pm \frac{7}{15}$

Remember that square roots can be positive or negative.
page 4A

Notes

② Seven added to the square of x

③ $19 - xy$

④ $7 - q$

⑤ $y^3 - 6$

$$\begin{aligned} \textcircled{6} \quad & 4[12 \div (6-2)]^2 \\ & 4[12 \div 4]^2 \\ & 4[3]^2 \\ & 4(9) \\ & 36 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & \frac{(1+6)9}{5^2-4} \\ & \frac{(7)9}{25-4} \\ & \frac{63}{21} \\ & 3 \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & \frac{2(4) + 3(16)^2}{4(8)^2 - 2(4)} \\ & \frac{8 + 3(256)}{4(64) - 8} \\ & \frac{8 + 768}{256 - 8} \\ & \frac{776}{248} \end{aligned}$$

$$\begin{aligned} & \frac{388}{124} = \\ & \frac{194}{62} = \\ & \frac{97}{31} = \end{aligned}$$

② Don't forget that your phrase has to indicate order of operations!

"less" stays in the same order as words...

"less than" reverses the order because your "starting value" is listed last.

order of operations!

PEMDAS

- ① simplify the numerator
- ② simplify the denominator
- ③ clear up division

use order of operations, then simplify.

Test 1 Test 2

(9) $\frac{36}{40}$ $\frac{47}{52}$

$1872 < 1880$

His percentage
was higher on
Test 2.

- (10) (a) given
(b) substitution property of equality
(c) substitution property of equality
(d) inverse property of multiplication
(e) substitution property of equality
(f) substitution property of equality

Week Two

Monday

(1) $4x^2 + 12x - 28$
(2) $12n^2 + -18n + 6n^2 - 15$
 $(12n^2 + 6n^2) - 18n - 15$
 $18n^2 - 18n - 15$

(3) $4ab + 12b + 17ab$
 $21ab + 12b$

(4) If $x = y$, then $y = x$

(5) $y = \frac{4(14-1)}{3(6)-5}$ $y = \frac{52}{13}$
 $y = \frac{4(13)}{18-5}$ $y = 4$

Notes

$\frac{a}{b} \times \frac{c}{d}$
 ad bc

(1) cross-multiply

(2) compare products

use Distributive Property

Combine like terms.
Change to addition so
that you can use the
Commutative Property.

Review reflexive, symmetric
and transitive properties.

Notes

substitute to solve

$$\begin{aligned} \textcircled{6} \quad & 4(1) = 20 \quad 4(3) = 20 \\ & 4 \neq 20 \quad \cancel{4 \neq 20} \\ & 4(5) = 20 \\ & 20 = 20 \checkmark \\ & K = 20 \end{aligned}$$

$$\textcircled{7} \textcircled{a} \{4, 6, 8, 10\}$$

$$\textcircled{b} \{2, 3, 4, 5\}$$

domain = set of x values
in a relation

range = set of y values
in a relation

$\textcircled{8}$ a set of ordered pairs

$$\begin{aligned} \textcircled{9} \quad & f(x) = x^2 - 2 \\ & f(5) = 5^2 - 2 \\ & = 25 - 2 \\ & = 23 \end{aligned}$$

substitute and solve

$$\begin{aligned} \textcircled{10} \quad & f(x) = x^2 - 2 \\ & f(b) = b^2 - 2 \end{aligned}$$

answer is in simplest form.

Wednesday

$\textcircled{1}$ hypothesis: "If I am working
on this Algebra packet"
conclusion: (then) "it must
be summer."

"If" = hypothesis

"then" = conclusion

$\textcircled{2}$ It does not have to be Wednesday
to eat M+M's.... they may be
eaten any day! :)

counterexample proves
the conditional statement
wrong.

$$\textcircled{3} \quad 7x = 56$$

$$\begin{aligned} \textcircled{4} \quad & -63 + m = -76 \\ & 63 \quad -63 \quad \cancel{63} \\ & +13 \quad m = -13 \end{aligned}$$

given

Add. Prop. of Equality

Add Prop Opp./Substitution/

Identity for Addition

Notes

$$\begin{aligned} \textcircled{5} \quad -1\frac{3}{8}k &= \frac{2}{3} \\ -\frac{11}{8}k &= \frac{2}{3} \\ -\frac{8}{11}\left(-\frac{11}{8}\right)k &= -\frac{8}{11}\left(\frac{2}{3}\right) \\ k &= -\frac{16}{33} \end{aligned}$$

change to improper

Mult. Prop. of Equality

substitution, cannot be reduced

$$\begin{aligned} \textcircled{6} \quad \text{Solve: } -\frac{9}{24} &= \frac{5}{12} \\ -12g &= \frac{120}{12} \\ g &= -10 \end{aligned}$$

cross-multiply

division property of equality

substitution

$$\begin{aligned} \textcircled{7} \quad 12 &= -7f - 9 \\ 12 &= -7f + -9 \\ 9 & \qquad \qquad 9 \\ \frac{21}{-7} &= \frac{-7f}{-7} \\ -3 &= f \end{aligned}$$

def'n of subtraction

add. prop. of eq.

add prop of opp / substitution

div. prop. of eq.

subst. prop. of eq.

$$\begin{aligned} \textcircled{8} \quad -\frac{3}{7} &= \frac{3}{4} - \frac{b}{2} \\ -\frac{3}{4} &= \frac{3}{4} \\ -\frac{33}{28} &= \frac{b}{-2} \end{aligned}$$

$$\text{LCD's} \quad -\frac{3}{7} + \frac{3}{4} = \frac{-12+21}{28} = \frac{9-33}{28}$$

mult. by. -2

$$\begin{aligned} -2\left(-\frac{33}{28}\right) &= -2\left(\frac{b}{-2}\right) \\ \frac{14}{14} \cdot \frac{66}{14} &= b \end{aligned}$$

use cancellation

use cancellation

$$\begin{aligned} \textcircled{9} \quad 2m - 13 &= -8m + 27 \\ \frac{8m}{8m} & \qquad \frac{8m}{8m} \\ 10m - 13 &= 27 \\ 13 & \quad 13 \\ 10m &= 40 \\ \frac{10m}{10} &= \frac{40}{10} \\ m &= 4 \end{aligned}$$

Use Add. Prop. of Eq. to move

variable terms to the left

and constants to the right.

Use Div. Prop. of Eq. to solve

Notes

Use the same steps as the last problem. Watch decimal rules!

Watch decimal division

$$\begin{aligned} (10) \quad 14.2t - 25.2 &= 3.8t + 26.8 \\ -3.8t &\quad -3.8t \\ \hline 10.4t + -25.2 &= 26.8 \\ &\quad 25.2 \quad 25.2 \\ \hline 10.4t &= 52.0 \\ \hline 10.4 &\quad 10.4 \\ \hline t &= 5 \end{aligned}$$

$$\begin{array}{r} 5.2 \\ 10.4 \overline{) 52.0} \\ \underline{52.0} \\ 0 \end{array}$$

Friday

① $|n+7|=18$

Remember that $\left| \begin{smallmatrix} + \\ \text{or} \\ - \end{smallmatrix} \right|$

$$\begin{aligned} (n+7) &= 18 & (n+7) &= -18 \\ -7 & -7 & -7 & -7 \\ \hline n &= 11 & n &= -25 \\ n &= \{-25, 11\} \end{aligned}$$

② $\emptyset$

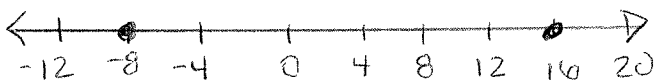
$||$ can never be negative

③ $\left| \frac{3}{4}a - 3 \right| = 9$

$$\begin{aligned} \left(\frac{3}{4}a - 3 \right) &= 9 & \left(\frac{3}{4}a - 3 \right) &= -9 \\ \frac{3}{4}a &= 12 & \frac{3}{4}a &= -6 \end{aligned}$$

$$\frac{4}{3} \left(\frac{3}{4}a \right) = \frac{4}{3} (12) \quad \frac{4}{3} \left(\frac{3}{4}a \right) = \frac{4}{3} (-6)$$

$$\begin{aligned} a &= 16 & a &= -8 \\ a &= \{-8, 16\} \end{aligned}$$



Dots on graph for single answers!

Notes

$$\textcircled{4} \quad \frac{x+4}{12} = \frac{3}{4}$$

$$4(x+4) = 3(12)$$

$$4x + 16 = 36$$

$$-16 \quad -16$$

$$\underline{4x = 20}$$

$$\underline{4 \quad 4}$$

$$x = 5$$

cross-multiply -

Do not forget the distributive prop!

$$\textcircled{5} \quad \frac{2}{3.5} \quad \frac{8}{14}$$

$$2(14) \quad 8(3.5)$$

$$28 = 28 \quad \checkmark$$

Yes, it is

a proportion

$$\textcircled{6} \quad 4^2 \cdot 3 - 5(6+3)$$

$$\underline{4^2 \cdot 3 - 5(9)}$$

$$\underline{16 \cdot 3 - 5(9)}$$

$$\underline{48 - 45}$$

$$3$$

PEMDAS

Order of operations

$$\textcircled{7} \quad \frac{x}{100} = \frac{15}{250} \quad \begin{array}{l} \rightarrow \text{amt of change} \\ \rightarrow \text{original amt} \end{array}$$

cross-multiply

"x" will be your %

$$\begin{array}{r} 30 \\ 250 \overline{) 7500} \\ \underline{2500} \\ 5000 \\ \underline{2500} \\ 2500 \\ \underline{2500} \\ 0 \end{array}$$

$$\underline{250x = 1500}$$

$$\underline{250 \quad 250}$$

$$x = 30\% \text{ increase}$$

→ amt. went up

$$\textcircled{8} \quad n = 8\% \text{ of } 240$$

$$n = 0.08(240)$$

$$n = \underline{19.20}$$

$$n = \$19.20$$

$$\textcircled{9} \quad sp = 800 - 0.35(800)$$

$$sp = 800 - 280.00$$

$$sp = \$520$$

Subtract the amount of discount from the original amt.

Notes

- (10) Negative fourteen added
to the product of seven
and g

Week Three

Monday

- (1) $7x - 2z = 4$, for z

$$\begin{array}{r} -7x \quad -7x \\ -2z = \frac{4-7x}{-2} \end{array}$$

$$z = \frac{4-7x}{-2}$$

Isolate z
by using equation
rules!

- (2) $5b + 12c = 9$

$$\begin{array}{r} -12c \quad -12c \end{array}$$

$$\frac{5b}{5} = \frac{9-12c}{5}$$

$$b = \frac{9-12c}{5}$$

- (3) $8k + 9 = 7k + 6$

$$\begin{array}{r} -7k \quad -7k \end{array}$$

$$k + 9 = 6$$

$$\begin{array}{r} -9 \quad -9 \end{array}$$

$$k = -3$$

- (4) $\frac{n}{4} + 17 = 25$

$$\begin{array}{r} -17 \quad -17 \\ 4\left(\frac{n}{4}\right) = (8)4 \end{array}$$

$$n = 32$$

- (5)

$$x = 13$$

$$x+1 = 14$$

$$x+2 = 15$$

$$x + x + 1 + x + 2 = 42$$

$$3x + 3 = 42$$

$$3x = 39$$

$$x = 13$$

$$\begin{aligned} x &= 15 \\ x+2 &= 17 \\ x+4 &= 19 \end{aligned}$$

$$x + x + 2 + x + 4 = 51$$

$$3x + 6 = 51$$

$$-6 \quad -6$$

$$\underline{3x = 45}$$

$$\underline{3 \quad 3}$$

$$x = 15$$

$$\textcircled{7} \quad 15 - 3n = -22$$

$$-15 \quad -15$$

$$-3n = -37$$

$$\underline{-3 \quad -3}$$

$$n = 12\frac{1}{3}$$

* Note: If the problem had said, "find the integer," the answer would have been $\emptyset$ because $12\frac{1}{3}$ is not an integer!

$$\textcircled{8} \quad \frac{750 + 750}{3 + 4.5}$$

$$\frac{1500}{7.5}$$

$$200$$

$$\text{mph}$$

$$200 \text{ mph}$$

$$\textcircled{*} \quad \frac{\text{total distance}}{\text{total time}}$$

$\textcircled{9}$

	r	t	d
East	40	x	40x
West	30	x	30x

$$40x + 30x = 245$$

$$\underline{70x = 245}$$

$$\underline{70 \quad 70}$$

$$x = 3.5 \text{ hrs.}$$

$$\textcircled{10}$$

Type	amt	price	total
PB	$x + 85$	6.50	$6.50(x + 85)$
CC	x	9	9x

$$6.50(x + 85) + 9x = 4055.50$$

$$6.5x + 552.5 + 9x = 4055.50$$

$$15.5x = 3503$$

$$x = 226 \text{ doz}$$

226 doz. choc. chip

311 doz. peanut butter

Wednesday

Notes:

①	r	t	d
cyclist 1	20	x	20x
cyclist 2	14	x	14x

If you subtract the distance of the slower cyclist from the faster cyclist's distance, the difference is 15 miles!

$$20x - 14x = 15$$

$$6x = 15$$

$$x = 2.5 \text{ hrs}$$

②

$$\begin{aligned} x &= 5 \\ x+2 &= 7 \\ x+4 &= 9 \end{aligned}$$

$$x + x + 2 = 4(x+4) - 24$$

$$2x + 2 = 4x + 16 - 24$$

$$2x + 2 = 4x - 8$$

$$-2x = -10$$

$$x = 5$$

③

$$\begin{aligned} 8+y &= 4x \\ 4x &= 8+y & (\text{symmetric}) \\ 4x-y &= 8 \end{aligned}$$

Standard Form: $Ax + By = C$

④ Linear equations do not have squared terms.

⑤

x	y
-2	1
-1	2
0	3
1	4
2	5

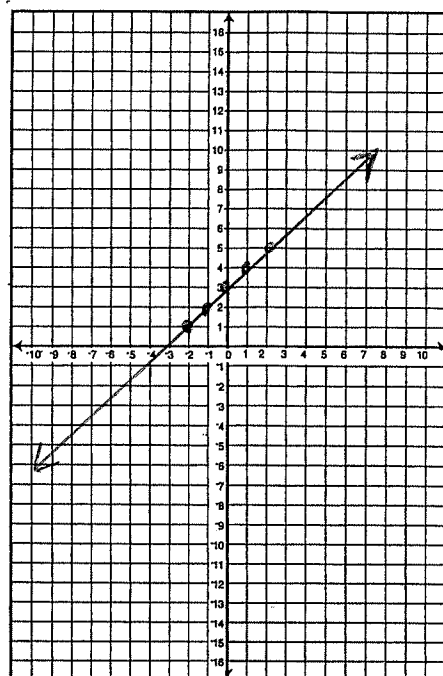
$$x - y = -3$$

$$-3 = x - y$$

$$y - 3 = x$$

$$y = x + 3$$

(symmetric)
(AP of E)
(AP of E)
(substitution)



Notes

$$\begin{array}{r} \textcircled{6} \quad 4x + 3 = 4x - 5 \\ -4x \quad -4x \\ \hline 3 = -5 \text{ FALSE} \\ \text{no solution} \end{array}$$

Remember, you can have
a solution (or solutions),
an identity (a true statement),
or no solution (a false statement).

$$\begin{array}{r} \textcircled{7} \quad x = 5y + 5 \\ \text{x-int.} \quad \quad \quad \text{y-int} \\ x = 5(0) + 5 \quad \quad 0 = 5y + 5 \\ x = 5 \quad \quad \quad \frac{-5 = 5y}{5 \quad 5} \\ \quad \quad \quad -1 = y \end{array}$$

$$\text{x-intercept: } y = 0$$

$$\text{y-intercept: } x = 0$$

$$\begin{array}{r} \textcircled{8} \quad x + y = 4 \\ \text{x-int} \quad \quad \quad \text{y-int} \\ x + 0 = 4 \quad \quad 0 + y = 4 \\ x = 4 \quad \quad \quad y = 4 \end{array}$$

$$\begin{array}{r} \textcircled{9} \quad y = -8x \\ \text{x-int} \quad \quad \quad \text{y-int} \\ 0 = -8x \quad \quad y = -8(0) \\ \frac{-8 \quad -8}{-8 \quad -8} \quad \quad y = 0 \\ 0 = x \end{array}$$

$$\begin{array}{r} \textcircled{10} \quad 2x - 7y = 14 \\ \text{x-int:} \quad \quad \quad \text{y-int.} \\ 2x - 7(0) = 14 \quad \quad 2(0) - 7y = 14 \\ 2x = 14 \quad \quad \quad -7y = 14 \\ x = 7 \quad \quad \quad y = -2 \end{array}$$

Friday

$$\textcircled{1} \quad m = \frac{y_2 - y_1}{x_2 - x_1}$$

rise
run

Notes

$$\textcircled{2} \quad \begin{matrix} (-3, 4) & (5, 3) \\ x_1, y_1 & x_2, y_2 \end{matrix}$$

$$\frac{3-4}{5-(-3)} = \frac{-1}{8}$$

$$\textcircled{3} \quad \begin{matrix} (-4, -2) & (-1, 11) \\ x_1, y_1 & x_2, y_2 \end{matrix}$$

$$\frac{11-(-2)}{-1-(-4)} = \frac{13}{3}$$

$$\textcircled{4} \quad \begin{matrix} (6, 7) & (6, -8) \\ x_1, y_1 & x_2, y_2 \end{matrix}$$

$$\frac{-8-7}{6-6} = \frac{-15}{0}$$

undefined

no denominator can
equal zero

An undefined slope is
a vertical line.

$$\textcircled{5} \quad \begin{matrix} (8, 2) & (9, 2) \\ x_1, y_1 & x_2, y_2 \end{matrix}$$

$$\frac{2-2}{9-8} = \frac{0}{1} = 0$$

Slope of a horizontal
line is zero.

$$\textcircled{6} \quad \begin{matrix} y = kx \\ 15 = k(9) \\ \frac{15}{9} = k \end{matrix}$$

$$\frac{5}{3} = k$$

$$\begin{matrix} y = kx \\ y = \frac{5}{3}(30) \\ y = 50 \end{matrix}$$

First, find "k" and
then substitute "k" and "x"
to solve for y.

$$\textcircled{7} \quad \begin{matrix} y = kx \\ 3.2 = k(.8) \\ \frac{3.2}{.8} = k \end{matrix}$$

$$4 = k$$

$$\begin{matrix} y = 4(20) \\ y = 80 \end{matrix}$$

$$(8) a_n = a_1 + (n-1)d$$

a_1 = first term

n = term "number" desired

d = common difference

$$(9) -10 - 3 = -13$$

$$-23 - -10 = -13$$

yes $d = -13$

$$(10) \begin{array}{r} 1.08 \\ -0.02 \\ \hline 1.06 \end{array} \quad \begin{array}{r} 2.14 \\ +1.06 \\ \hline 3.20 \end{array} \quad \begin{array}{r} 3.20 \\ 1.06 \\ \hline 4.26 \end{array} \quad \begin{array}{r} 4.26 \\ 1.06 \\ \hline 5.32 \end{array}$$

Week Four

Monday

Write the following in
slope - int.

$$(1) \begin{array}{r} -4x + y = 2 \\ 4x \quad 4x \\ \hline y = 4x + 2 \end{array}$$

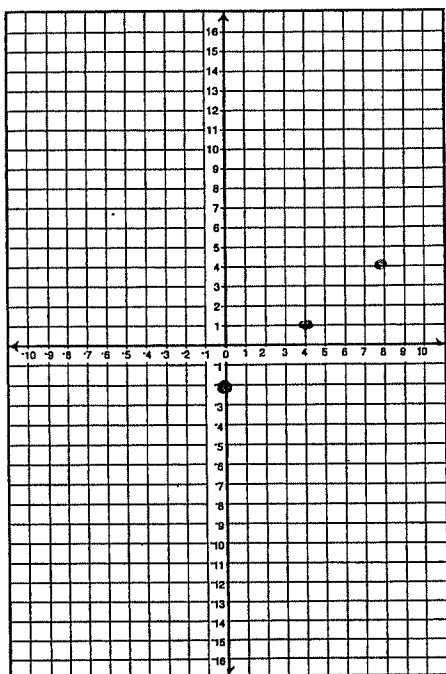
$$(2) y = 2x - 1$$

$$(3) \begin{array}{r} 6x - 4y = 16 \\ -6x \quad -6x \\ \hline -4y = -6x + 16 \\ \frac{-4y}{-4} = \frac{-6x}{-4} + \frac{16}{-4} \\ y = \frac{3}{2}x - 4 \end{array}$$

$$y = mx + b$$

$\downarrow$ slope $\rightarrow$ y-int

4



Graph y-int (-2)

"count" slope

$\frac{3}{4}$ rise
run

"Up 3, rt 4"

5

$$\frac{1}{2} = \frac{y_2 - y_1}{x_2 - x_1}$$

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

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

$$x - 2 = 2y + 6$$

$$2y + 6 = x - 2$$

$$\frac{2y}{2} = \frac{x - 8}{2}$$

$$y = \frac{1}{2}x - 4$$

—————> slope-int. form.

$$\frac{1}{2}x - 4 = y$$

$$\frac{1}{2}x = y + 4$$

$$2\left(\frac{1}{2}x - y\right) = (4)2$$

$$x - 2y = 8 \rightarrow \text{standard form}$$

Set-up given values.

Cross multiply

$$\textcircled{6} \quad \begin{matrix} (-3, -4) & (-2, -8) \\ x_1 & y_1 & x_2 & y_2 \end{matrix}$$

$$\frac{-8 - -4}{-2 - -3} = \frac{-4}{1} = -4$$

$$m = -4$$

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

$$-4(x + 3) = y + 4$$

$$-4x + -12 = y + 4$$

$$-4x - 16 = y$$

$$y = -4x - 16$$

$$4x \quad 4x$$

$$4x + y = -16$$

→

slope - int

→

standard form

*no negatives or fractions as x-coefficient!

$$\textcircled{7} \quad y - y_1 = m(x - x_1)$$

$$\textcircled{8} \quad y - -8 = 5(x - -2)$$

$$y + 8 = 5x + 10$$

$$\textcircled{9} \quad y - 10 = 2(x - 8)$$

$$y - 10 = 2x - 16$$

$$2x - 16 = y - 10$$

$$-y - y$$

$$2x - y - 16 = -10$$

$$16 \quad 16$$

$$2x - y = 6$$

pt-slope form

standard form

$$Ax + By = C$$

$$\textcircled{10} \quad -4/3$$

perpendicular slopes are "opposite" reciprocals

Wednesday

$$\textcircled{1} \quad \begin{matrix} 3x - y = 17 \\ -3x \quad -3x \end{matrix}$$

$$-1(-y) = (-3x + 17) - 1$$

$$y = 3x + 17$$

↗

parallel slope = 3

parallel slopes are the same

page 18 A

$$(2) 2x - 6y = -5$$

$$-6y = -2x - 5$$

$$y = \frac{1}{3}x + \frac{5}{6}$$

$$m = \frac{1}{3}$$

perpendicular line's

$$\text{slope} = -3$$

$$(3) m = -\frac{1}{4}$$

perpendicular slope = 4

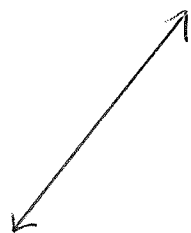
$$y - 6 = 4(x - 2)$$

$$y - 6 = 4x - 8$$

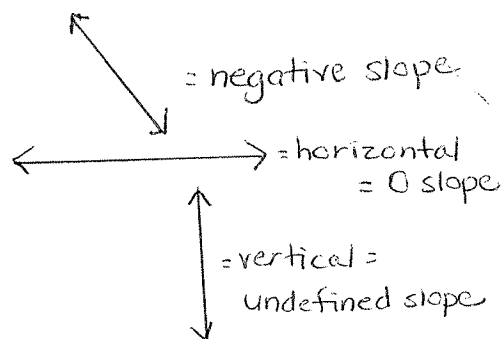
$$y = 4x - 2$$

$$(4) \{4, 3, 2, -4, 5\}$$

(5)



range = "y" in the
ordered pairs
of the relation



$$(6) |x - 4| = 9$$

$$(x - 4) = 9 \quad (x - 4) = -9$$

$$x = 13$$

$$x = -5$$

$$x = \{-5, 13\}$$

$$(7) 12n - 4 \leq 13n$$

$$13n \geq 12n - 4$$

$$-12n \quad -12n$$

$$n \geq -4$$

$$\{n \mid n \geq -4\}$$

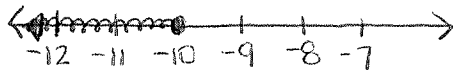
* When the "sides" are
switched, the inequality
reverses.
→ add. prop. for inequalities

$$\textcircled{8} \quad -\frac{3}{5}d \geq 6$$

$$-\frac{5}{3}\left(-\frac{3}{5}d\right) \leq -\frac{5}{3}(6)$$

$$d \leq -10$$

$$\{d \mid d \leq -10\}$$



* When you multiply both sides of an inequality by a negative, the inequality reverses.

$$\textcircled{9} \quad 2(x-4) \leq 2 + (3)(x-6)$$

$$2x + -8 \leq 2 + 3x + -18$$

$$2x + -8 \leq 3x + -16$$

$$-3x \quad -3x$$

$$-x + -8 \leq -16$$

$$8 \quad 8$$

$$-x \leq -8$$

$$-1(-x) \geq -1(-8)$$

$$x \geq 8$$

$$\{x \mid x \geq 8\}$$

* mult. by a negative reverses the inequality.

$$\textcircled{10} \quad -3 \leq 7c + 4 < 18$$

$$-3 \leq 7c + 4 \quad \text{AND} \quad 7c + 4 < 18$$

$$7c + 4 \geq -3$$

$$-4 \quad -4$$

$$7c \geq -7$$

$$c \geq -1$$

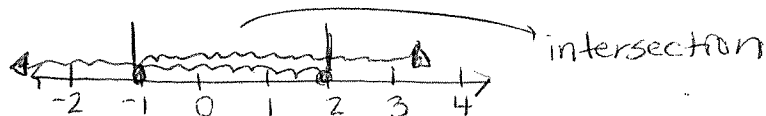
$$7c \leq 14$$

$$\frac{7}{7} \quad \frac{14}{7}$$

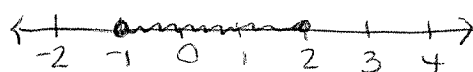
$$c \leq 2$$

"between" uses the conjunction "and" and tells you to find the intersection.

working graph



final graph



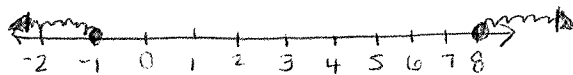
$$\{c \mid -1 \leq c \leq 2\}$$

Friday

$$\textcircled{1} \quad y-1 \geq 7 \quad \text{or} \quad y+3 \leq 2$$

$$\quad \quad \quad 1 \quad \quad \quad -3 \quad -3$$

$$y \geq 8 \quad \quad \quad y \leq -1$$



$$\{y \mid y \leq -1 \text{ or } y \geq 8\}$$

$$\textcircled{2} \quad \frac{14}{x} = \frac{20}{8}$$

$$\frac{112}{20} = \frac{20x}{20}$$

$$5.6 = x$$

$$\textcircled{3} \quad |5x-2| \leq 6$$

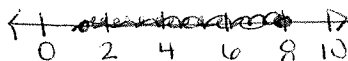
$$5x-2 \leq 6 \quad \text{AND} \quad 5x-2 \geq 6$$

$$2 \quad 2$$

$$5x \geq 8$$

$$5x \leq 8$$

$$x \geq 8/5$$



$$\textcircled{4} \quad |-3p-7| > 5$$

$$(-3p-7) > 5 \quad \text{or} \quad (-3p-7) < -5$$

$$-3p-7 > 5$$

$$1 \quad 1$$

$$-3p > 12$$

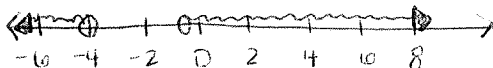
$$p < -4$$

$$-3p-7 < -5$$

$$1 \quad 1$$

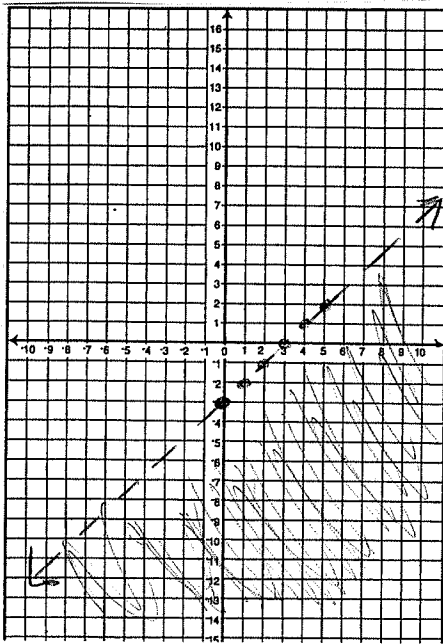
$$-3p < 2$$

$$p > -2/3$$



Notes

⑤ $y < x - 3$
 $\hookrightarrow$



dotted line for $<$
 $m = 1$
 $y\text{-int} = -3$

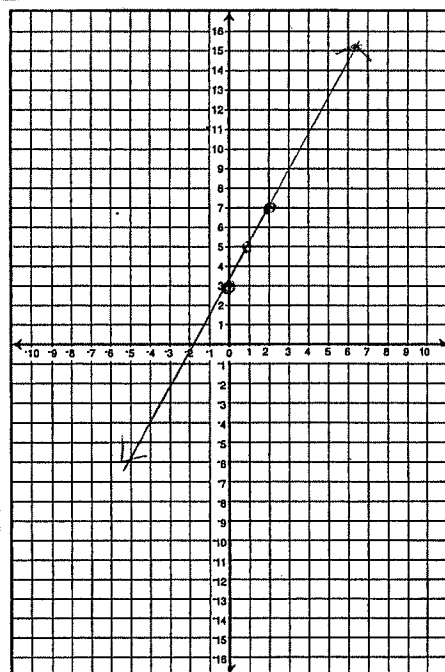
check $0 < 0 - 3$ $(0, 0)$
 $0 < -3$ FALSE
 color opposite
 side of graph

double check $(7, -1)$
 $-1 < 7 - 3$
 $-1 < 4$ ✓

⑥ $y = mx + b$
 $mx + b = y$
 $-b -b$
 $\frac{mx}{m} = \frac{y - b}{m}$
 $x = \frac{y - b}{m}$

⑦ $y = 2x + 3$
 $8x - 4y = -12$
 $\frac{-4y}{-4} = \frac{-8x - 12}{-4}$
 $* y = 2x + 3$

same line
 infinitely many
 solutions



Notes

isolate "x"

substitute

$$\begin{aligned} & \left. \begin{array}{l} x + y = 4 \\ 4x + y = 1 \end{array} \right\} \\ \textcircled{8} \quad & x = 4 - y \\ & 4(4 - y) + y = 1 \\ & 16 - 4y + y = 1 \\ & 16 - 3y = 1 \\ & -16 \quad -16 \\ & -3y = -15 \\ & y = 5 \end{aligned}$$

$$x = 4 - 5$$

$$x = -1$$

$$\{-1, 5\}$$

$$\begin{aligned} \textcircled{9} \quad & -3x + 4y = 12 \\ & 3x - 6y = 18 \\ \hline & -2y = 30 \\ & y = -15 \end{aligned}$$

$$\begin{aligned} -3x + 4(-15) &= 12 \\ -3x + -60 &= 12 \\ & 60 \quad 60 \end{aligned}$$

$$\begin{aligned} -3x &= 72 \\ -3 \quad -3 \end{aligned}$$

$$x = -24$$

$$(-24, -15)$$

$$\begin{aligned} \textcircled{10} \quad & 3x - 3y = -6 \\ & -5x + 6y = 12 \end{aligned}$$

$$\begin{aligned} 6x + -6y &= -12 \\ -5x + 6y &= 12 \\ \hline x &= 0 \end{aligned}$$

$$\begin{aligned} 3(0) - 3y &= -6 \\ -3 \quad -3 \\ y &= 2 \end{aligned}$$

$$(0, 2)$$

add the two equations together to eliminate one of the variables.

substitute to solve for x

multiply the first equation by 2

then use the addition method above to solve

substitute for x to find y

Week Five :

Monday

$$\textcircled{1} \quad 3 \begin{bmatrix} -8 & 4 & 5 \\ 3 & 8 & 2 \\ 6 & 0 & 1 \end{bmatrix} =$$

$$\begin{bmatrix} -24 & 12 & 15 \\ 9 & 24 & 6 \\ 18 & 0 & 3 \end{bmatrix}$$

Multiply the scalar times each member of the matrix.

$$\textcircled{2} \quad \begin{bmatrix} -8 & 15 & 9 \\ 4 & -3 & 7 \end{bmatrix} + \begin{bmatrix} -12 & 10 & -13 \\ -8 & 11 & -6 \end{bmatrix}$$

$$\begin{bmatrix} -20 & 25 & -4 \\ -4 & 8 & 1 \end{bmatrix}$$

Add each element in the first matrix to the corresponding element in the second matrix.

$$\textcircled{3} \quad \begin{bmatrix} -12 & 10 & -13 \\ -8 & 11 & -6 \end{bmatrix} - \begin{bmatrix} -8 & 15 & 9 \\ 4 & -3 & 7 \end{bmatrix}$$

$$\begin{bmatrix} -4 & -5 & -22 \\ -12 & 14 & -13 \end{bmatrix}$$

Each element in matrix B minus each corresponding element in matrix A

$$\textcircled{4} \quad (5a^2b^3)(7ab^4)$$

$$35a^{2+1}b^{3+4}$$

$$35a^3b^7$$

multiply constants
add exponents for variables being multiplied.

$$\textcircled{5} \quad (0.4h^3)^2$$

$$0.16h^6$$

square the constant
multiply the exponents when raising a power to a power

$$\textcircled{6} \left(\frac{4}{5}x^2\right)^2$$

$$\frac{16}{25}x^4$$

$$\textcircled{7} \frac{x^8 y^{12}}{x^3 z^4}$$

$$\frac{x^5 y^{12}}{z^4}$$

subtract exponents when dividing.

$$\textcircled{8} \frac{1}{n^6}$$

negative exponents are reciprocals

$$\textcircled{9} 8a^{-8-3}b^{3-5}c^{-4-2}$$

$$8a^{-11}b^{-2}c^{-6}$$

$$\frac{8b^8}{a^{11}c^6}$$

simplest form has all exponents written as positives

$$\textcircled{10} \left(\frac{-3x^{-6}y^{-1}z^{-2}}{6x^{-2}yz^{-5}}\right)^{-2}$$

$$\frac{(-3)^{-2}x^{12}y^2z^4}{(6)^{-2}x^4y^{-2}z^{10}}$$

$$\frac{36x^8y^4}{9z^6}$$

$$(-3)^{-2} = 9^{-1} \rightarrow 9 \text{ to the denom.}$$

$$6^{-2} = 36^{-1} \rightarrow 36 \text{ to the num.}$$

$$x^{12-4} \rightarrow x^8 \text{ num.}$$

$$y^{2-2} \rightarrow y^0 \text{ num.}$$

$$z^{4-10} \rightarrow z^{-6} \rightarrow z^6 \text{ denom.}$$

Wednesday:

$$\textcircled{1} 10,700,000$$

$$1.07 \times 10^7$$

dec. after first non-zero value on left.

multiply by the power of 10 that will move the dec. the correct number of places.

Notes

② 1.67×10^{-4}
0.000167

negative exponent of 10 will move the decimal to the left.

③ $(7.08 \times 10^{14})(5 \times 10^{-9})$
 $(7.08 \times 5)(10^{14+(-9)})$
 35.4×10^5
 3.54×10^6

Use comm. and assoc. properties to mult. values and then powers of 10

④ $\frac{2.05 \times 10^{-8}}{4 \times 10^{-2}}$
 $(2.05 \div 4)(10^{-8-(-2)})$
 $(0.5125)(10^{-6})$
 5.125×10^{-7}

divide values, then powers of 10

⑤ 0

constants have a degree of 0

⑥ $7x^3y^2z$ 6

add all variable exponents

⑦ $18x^3y^2 - 7x^2y^3 + 7z^7$
 $\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ 5 & 5 & 7 \end{array}$
7

polynomial degree is the highest monomial degree in the polynomial

⑧ $\begin{array}{r} 6x^3 + -4y \\ -2x^3 \quad + 9 \\ \hline 4x^3 - 4y + 9 \end{array}$

add only like terms

⑨ $\begin{array}{r} -4z^3 \{ -2z + 8 \\ -4z^3 + -3z^2 \} + 5 \\ \hline -8z^3 - 3z^2 - 2z + 13 \end{array}$

change each sign $\rightarrow$ add like terms

$$\begin{array}{r}
 (10) \quad 4x + 2y + -6z \\
 7x + 5y + -2z \\
 -2x + -3y + -9z \\
 \hline
 9x + 4y - 17z
 \end{array}$$

Friday:

$$\begin{array}{l}
 (1) \quad 5w(6w^2 - 3w + 7) \\
 30w^3 - 15w^2 + 35w
 \end{array}$$

distributive property

$$\begin{array}{l}
 (2) \quad x(3x^2 + 4) + 2(7x - 3) \\
 3x^3 + 4x + 14x - 6 \\
 3x^3 + 18x - 6
 \end{array}$$

$$\begin{array}{l}
 (3) \quad t(2t + 3) + 20 = 2t(t - 3) \\
 2t^2 + 3t + 20 = 2t^2 - 6t \\
 -2t^2 \qquad \qquad -2t^2 \\
 3t + 20 = -6t \\
 -3t \qquad \qquad -3t \\
 20 = -9t \\
 \frac{20}{-9} = \frac{-9t}{-9} \\
 -20/9 = t \\
 \text{or } -2\frac{2}{9}
 \end{array}$$

$$\begin{array}{l}
 (4) \quad (3a + 2)(a - 6) \\
 3a^2 + -18a + 2a - 12 \\
 3a^2 - 16a - 12
 \end{array}$$

FOIL

$$\begin{array}{l}
 (5) \quad (z - 6)(z + 6) \\
 z^2 + 6z - 6z - 36 \\
 z^2 - 36
 \end{array}$$

$$\begin{aligned} & (6) (2y+7)(3y-6) \\ & 6y^2 - 12y + 21y - 42 \\ & 6y^2 + 9y - 42 \end{aligned}$$

$$\begin{aligned} & (7) (3a+4)(a^2-12a+1) \\ & 3a^3 - 36a^2 + 3a \\ & \quad 4a^2 - 48a + 4 \\ & \hline \end{aligned}$$

$$3a^3 - 32a^2 - 45a + 4$$

$$(8) (m+2) \left[(m^2+3m-6) + (m^2-2m+4) \right]$$

$$\begin{aligned} & (m+2) [2m^2+m-2] \\ & 2m^3 + m^2 - 2m \\ & \quad 4m^2 + 2m - 4 \\ & \hline & 2m^3 + 5m^2 - 4 \end{aligned}$$

$$\begin{aligned} & (9) (4x+6)^2 \\ & (4x+6)(4x+6) \\ & 16x^2 + 24x + 24x + 36 \\ & 16x^2 + 48x + 36 \end{aligned}$$

$$\begin{aligned} & (10) (w-7)^2 \\ & (w-7)(w-7) \\ & w^2 - 7w - 7w + 49 \\ & w^2 - 14w + 49 \end{aligned}$$

Week Six
Factoring

Monday:

$$(1) -1 \cdot 2 \cdot 2 \cdot 13 a a b b b b$$

With negatives, write a "-1"
and then the prime factorization

Notes

Prime Factorization

common factors

$$\begin{aligned} \textcircled{2} \quad 25x^3 &= 5 \cdot \underbrace{5 \cdot x}_{\text{common}} \cdot x \cdot x \\ 45x^5 &= 3 \cdot 3 \cdot \underbrace{5 \cdot x}_{\text{common}} \cdot x \cdot x \cdot x \cdot x \\ 75x &= 3 \cdot \underbrace{5 \cdot x}_{\text{common}} \end{aligned}$$

$$\text{GCF} = 5x$$

$$\begin{aligned} \textcircled{3} \quad 15x^2 - 30x \\ 15x(x - 2) \end{aligned}$$

pull out GCF

$$\begin{aligned} \textcircled{4} \quad 2xy + 7x - 2y - 7 \\ (2xy + 7x) + (-2y - 7) \\ x(2y + 7) - 1(2y + 7) \\ (2y + 7)(x - 1) \end{aligned}$$

change subtr. to add.
group in two's

pull out GCF
write factorizations

$$\begin{aligned} \textcircled{5} \quad w^2 + 25 \\ \text{prime} \end{aligned}$$

prime $\rightarrow$ addition!

$$\begin{aligned} \textcircled{6} \quad c^2 + 3c \\ c(c + 3) \end{aligned}$$

factor by GCF

$$\begin{aligned} \textcircled{7} \quad 3k(k + 10) &= 0 \\ 3k &= 0 & k + 10 &= 0 \\ k &= 0 & k &= -10 \\ & & \{0, -10\} \end{aligned}$$

Zero Product property!
Set each factor equal to 0

$$\begin{aligned} \textcircled{8} \quad d^2 &= 3d \\ d^2 - 3d &= 0 \\ d(d - 3) &= 0 \\ d &= 0 & d - 3 &= 0 \\ & & d &= 3 \end{aligned}$$

Set equal to 0

$$(9) \quad 2n(n+3)(n-6) = 0$$

$$2n = 0 \quad n+3 = 0 \quad n-6 = 0$$

$$n = 0 \quad n = -3 \quad n = 6$$

$$n = \{0, -3, 6\}$$

$$(10) \quad (ab^4)(7a^2b)(3a)^2 \\ (ab^4)(7a^2b)(9a^2) \\ 63a^5b^5$$

Wednesday:

$$(1) \quad 4a^2 - 25 \\ (2a+5)(2a-5)$$

$$(2) \quad 2c^3 + 3c^2 - 2c - 3 \\ (2c^3 + 3c^2) + (-2c - 3) \\ c^2(2c+3) + -1(2c+3) \\ (c^2-1)(2c+3) \\ (c+1)(c-1)(2c+3)$$

group!
pull out GCF

$$(3) \quad r^4 - k^4 \\ (r^2 + k^2)(r^2 - k^2) \\ (r^2 + k^2)(r+k)(r-k)$$

$$(4) \quad 4a^2 = \frac{9}{64} \\ -9/64 \quad -9/64 \\ 4a^2 - \frac{9}{64} = 0$$

Get everything for the
quadratic equation on
one side equal to zero.

$$(2a + \frac{3}{8})(2a - \frac{3}{8}) = 0 \\ 2a + \frac{3}{8} = 0 \quad 2a - \frac{3}{8} = 0 \\ \frac{1}{2}(2a) = (-\frac{3}{8}) \cdot \frac{1}{2} \quad \frac{1}{2}(2a) = (\frac{3}{8}) \cdot \frac{1}{2} \\ a = -\frac{3}{16} \quad a = \frac{3}{16}$$

Factor as difference of
squares!

Notes

$$\textcircled{5} \quad 4x^2 + 64$$

$$4(x^2 + 16)$$

GCF!

$$\textcircled{6} \quad 8(y^2 - 25z^2)$$

$$8(y + 5z)(y - 5z)$$

GCF

difference of squares

$$\textcircled{7} \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - (4 \cdot 1 \cdot 3)}}{2(1)}$$

$$a = 1$$

$$b = -4$$

$$c = 3$$

$$x = \frac{4 \pm \sqrt{16 - 12}}{2}$$

$$x = \frac{4 \pm \sqrt{4}}{2}$$

$$x = \frac{4+2}{2} \quad x = \frac{4-2}{2}$$

$$x = \frac{6}{2} \quad x = \frac{2}{2}$$

$$x = 3 \quad x = 1$$

$$\textcircled{8} \quad 2x^2 - 9x = -8$$

$$2x^2 - 9x + 8 = 0$$

set the quadratic equal to zero.

$$x = \frac{-(-9) \pm \sqrt{(-9)^2 - (4 \cdot 2 \cdot 8)}}{2 \cdot 2}$$

$$x = \frac{9 \pm \sqrt{81 - 64}}{4}$$

$$x = \frac{9 \pm \sqrt{17}}{4}$$

$$x = \frac{9+4.1}{4} \quad x = \frac{9-4.1}{4}$$

$$x = \frac{13.1}{4} \quad x = \frac{4.9}{4}$$

$$x = 3.3 \quad x = 1.2$$

Notes

prime factorization

$$\begin{aligned} \textcircled{9} \quad & \sqrt{68} \\ & \sqrt{2 \cdot 2 \cdot 17} \\ & 2\sqrt{17} \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad & \frac{\sqrt{5} \cdot \sqrt{6} \cdot \sqrt{2}}{\sqrt{5 \cdot 2 \cdot 3 \cdot 2}} \end{aligned}$$

- write prime factorizations for each radicand
- pull out "perfect squares"

Friday

$$\begin{aligned} \textcircled{1} \quad & 3\sqrt{10} \cdot 4\sqrt{5} \\ & 3 \cdot 4 \sqrt{2 \cdot 5 \cdot 5} \\ & 3 \cdot 4 \cdot 5 \sqrt{2} \\ & 60\sqrt{2} \end{aligned}$$

- multiply radicands
- multiply factors
- simplify

$$\begin{aligned} \textcircled{2} \quad & 4\sqrt{121x^3y^5} \\ & 4\sqrt{11 \cdot 11 \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y} \\ & 4 \cdot 11 \cdot x \cdot y^2 \sqrt{xy} \\ & 44xy^2\sqrt{xy} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & \sqrt{6c^3d^3} \cdot \sqrt{8c^3d} \\ & \sqrt{2 \cdot 3 \cdot 2 \cdot 2 \cdot 2 \cdot c^3 \cdot c^3 \cdot d^3 \cdot d} \\ & 2 \cdot 2 c^3 d^2 \sqrt{3} \\ & 4c^3d^2\sqrt{3} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & \sqrt{\frac{2}{3}} \cdot \sqrt{\frac{6}{12}} \\ & \sqrt{\frac{2}{3} \cdot \frac{1}{3}} \\ & \frac{\sqrt{2}}{\sqrt{9}} \\ & \frac{\sqrt{2}}{3} \end{aligned}$$

reduce!

Notes

⑤

$$\frac{7}{6+\sqrt{3}}$$

$$\frac{7}{6+\sqrt{3}} \cdot \frac{6-\sqrt{3}}{6-\sqrt{3}}$$

$$\frac{42-7\sqrt{3}}{36-3}$$

$$\frac{42-7\sqrt{3}}{33}$$

can not reduce

⑥

$$\frac{5}{\sqrt{6}+\sqrt{3}}$$

$$\frac{5}{\sqrt{6}+\sqrt{3}} \cdot \frac{\sqrt{6}-\sqrt{3}}{\sqrt{6}-\sqrt{3}}$$

$$\frac{5\sqrt{6}-5\sqrt{3}}{6-3}$$

$$\frac{5\sqrt{6}-5\sqrt{3}}{3}$$

⑦

$$\frac{\sqrt{45a^4b^5c^6}}{\sqrt{9a^5b}}$$

$$\frac{\sqrt{3 \cdot 3 \cdot 5a^4b^4bc^3c^3}}{\sqrt{3 \cdot 3a^4ab}}$$

$$\frac{3a^2b^2c^3\sqrt{5b}}{3a^2\sqrt{ab}}$$

$$\frac{3a^2b^2c^3\sqrt{5b}}{3a^2\sqrt{ab}}$$

$$\cdot \frac{\sqrt{ab}}{\sqrt{ab}}$$

factor/simplify first!

rationalize the denominator

$$\frac{\cancel{3}a^2b^2c^3\sqrt{5ab^2}}{\cancel{3}a^2\sqrt{a^2b^2}}$$

$$\frac{b^2c^3\sqrt{5a}}{b^2c^2\sqrt{5a}}$$

$$\frac{ab}{b^2c^2\sqrt{5a}}$$

$$\frac{a}{b^2c^2\sqrt{5a}}$$

simplify

Notes

$$\begin{aligned} \textcircled{8} \quad & 5\sqrt{2} + 6\sqrt{3} - 8\sqrt{2} \\ & - 3\sqrt{2} + 6\sqrt{3} \end{aligned}$$

treat add/subt. of
radicands like the
add/subt of like terms.

$$\begin{aligned} \textcircled{9} \quad & 4\sqrt{10} + 6\sqrt{40} \\ & 4\sqrt{10} + 6\sqrt{4 \cdot 10} \\ & 4\sqrt{10} + 12\sqrt{10} \\ & 16\sqrt{10} \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad & \sqrt{5}(\sqrt{2} + 4\sqrt{2}) \\ & \sqrt{5}(5\sqrt{2}) \\ & 5\sqrt{10} \end{aligned}$$

simplify
multiply

Week Seren

Monday

$$\begin{aligned} \textcircled{1} \quad & 14^2 + 15^2 = 50^2 \\ & 196 + 225 = 2500 \\ & 421 \neq 2500 \\ & \text{a) no } \text{b) no} \end{aligned}$$

$$a^2 + b^2 = c^2$$

$$\begin{aligned} \textcircled{2} \quad & (\sqrt{7})^2 + (8)^2 = (\sqrt{71})^2 \\ & 7 + 64 = 71 \\ & 71 = 71 \\ & \text{a) yes } \text{b) no} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & 9^2 + 12^2 = 15^2 \\ & 81 + 144 = 225 \\ & 225 = 225 \\ & \text{a) yes } \text{b) yes} \end{aligned}$$

$$(4) \quad 7^2 + 6^2 = c^2$$

$$49 + 36 = c^2$$

$$\sqrt{85} = \sqrt{c^2}$$

$$9.2 = c$$

$$(5) \quad 20^2 + b^2 = 29^2$$

$$400 + b^2 = 841$$

$$\sqrt{b^2} = \sqrt{441}$$

$$b = 21$$

$$(6) \quad a^2 + 12^2 = 25^2$$

$$a^2 + 144 = 625$$

$$\sqrt{a^2} = \sqrt{481}$$

$$a = 21.9$$

Distance Formula!

$$(7) \quad d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \rightarrow (8) \quad d = \sqrt{(5 - 3)^2 + (-5 - 6)^2}$$

$$d = \sqrt{(-2 - 3)^2 + (-1 - 1)^2}$$

$$d = \sqrt{(2)^2 + (-11)^2}$$

$$d = \sqrt{(-5)^2 + (-2)^2}$$

$$d = \sqrt{4 + 121}$$

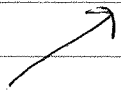
$$d = \sqrt{25 + 4}$$

$$d = \sqrt{125}$$

$$d = \sqrt{29}$$

$$d = 11.2$$

$$d = 5.4$$



$$(9) d = \sqrt{(5-5)^2 + (13-1)^2}$$

$$d = \sqrt{0^2 + 14^2}$$

$$d = \sqrt{196}$$

$$d = 14$$

$$(10) d = \sqrt{(10-6)^2 + (0-3)^2}$$

$$d = \sqrt{4^2 + (-3)^2}$$

$$d = \sqrt{16+9}$$

$$d = \sqrt{25}$$

$$d = 5$$

Wednesday

$$(1) \frac{3+3}{2}, \frac{6+2}{2}$$

$$\frac{6}{2}, \frac{8}{2}$$

$$(3, 4)$$

Mid-Point Formula

$$\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}$$

*write answers as
ordered pairs!

$$(2) \frac{6+(-4)}{2}, \frac{-4+(-11)}{2}$$

$$\frac{2}{2}, \frac{-15}{2}$$

$$1, -7\frac{1}{2}$$

$$(1, -7\frac{1}{2})$$

$$(3) \frac{-4+6}{2}, \frac{2+3}{2}$$

$$\frac{2}{2}, \frac{5}{2}$$

$$1, 2\frac{1}{2}$$

$$(1, 2\frac{1}{2})$$

4

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$10 = \sqrt{(-6-2)^2 + (a-1)^2}$$

$$10 = \sqrt{(-8)^2 + (a^2 + 2a + 1)}$$

$$10 = \sqrt{64 + a^2 + 2a + 1}$$

$$(10)^2 = (a^2 + 2a + 65)^2$$

$$100 = a^2 + 2a + 65$$

$$0 = a^2 + 2a - 35$$

$$0 = (a+7)(a-5)$$

$$0 = a+7 \quad 0 = a-5$$

$$-7 = a \quad 5 = a$$

5

$$\sqrt{61} = \sqrt{(a-1)^2 + (6-0)^2}$$

$$\sqrt{61} = \sqrt{a^2 - 2a + 1 + 36}$$

$$(\sqrt{61})^2 = (a^2 - 2a + 37)^2$$

$$61 = a^2 - 2a + 37$$

$$0 = a^2 - 2a - 24$$

$$0 = (a-6)(a+4)$$

$$0 = a-6 \quad 0 = a+4$$

$$6 = a \quad -4 = a$$

6

$$\frac{p+5}{2(p+5)}$$

$$\frac{1}{2}$$

$$\frac{1}{2}$$

Factor

Cross-out like factors

in the numerator

and denominator

7

$$\frac{13a^2b}{39ab^3} = \frac{\overset{a}{\cancel{13}} \cdot \cancel{a^2} \cdot \cancel{b}}{\underset{3}{\cancel{39}} \cdot \cancel{a} \cdot \underset{b^2}{\cancel{b^3}}}$$

$$\frac{a}{3b^2}$$

$$\begin{array}{r} \textcircled{8} \quad \frac{r^3 - r^2}{r - 1} \\ \underline{r^2(\cancel{r-1})} \\ \cancel{r-1} \\ r^2 \end{array}$$

$$\begin{array}{r} \textcircled{9} \quad \frac{6y^3 - 12y^2}{12y^2 - 18} \\ \underline{6y^2(\cancel{y-2})} \\ \cancel{6}(2y^2 - 3) \\ y^2(\cancel{y-2}) \\ 2y^2 - 3 \end{array}$$

$$\begin{array}{r} \textcircled{10} \quad \frac{5x^2 + 10x + 5}{3x^2 + 6x + 3} \\ \underline{5(\cancel{x^2 + 2x + 1})} \\ 3(\cancel{x^2 + 2x + 1}) \\ \frac{5}{3} \end{array}$$

Friday

$$\begin{array}{r} \textcircled{1} \quad \frac{a^2b}{b^2c} \cdot \frac{c^2d}{bd} \\ \underline{a\cancel{a}b\cancel{c}c\cancel{d}} \\ \cancel{b}b\cancel{b}d \\ \frac{a^2c}{bd} \end{array}$$

Use cancellation!

$$\begin{array}{r} \textcircled{2} \quad \frac{5n-5}{3} \cdot \frac{9}{n-1} \\ \underline{5(\cancel{n-1}) \cdot 3 \cdot 3} \\ \cancel{3}(\cancel{n-1}) \end{array} = 15$$

$$\begin{aligned} \textcircled{3} \quad & \frac{a^2}{a-b} \cdot \frac{3a-3b}{ab} \\ & \frac{\cancel{a} \cdot a \cdot 3(\cancel{a-b})}{(\cancel{a-b}) ab} \\ & \frac{3a}{b} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & \frac{(x^2-y^2)}{(x-y)^2} \cdot \frac{x-y}{x+y} \\ & \frac{(\cancel{x+y})(\cancel{x-y})(\cancel{x-y})}{(\cancel{x-y})(\cancel{x-y})(x+y)} \\ & \frac{1}{x+y} \end{aligned}$$

Everything cancels!

$$\begin{aligned} \textcircled{5} \quad & \frac{5d-f}{5d+f} \cdot \frac{1}{25d^2-f^2} \\ & \frac{(\cancel{5d-f}) \cdot 1}{(5d+f)(5d+f)(\cancel{5d-f})} \\ & \frac{1}{(5d+f)^2} \end{aligned}$$

multiply by the reciprocal!

$$\begin{aligned} \textcircled{6} \quad & \frac{a^2+10a+21}{a+7} \\ & \frac{(\cancel{a+7})(a+3)}{\cancel{a+7}} \\ & a+3 \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & \frac{8x^5-10xy^2}{2xy^3} \quad (x \neq 0, y \neq 0) \\ & \frac{\cancel{2x}(4x^4-5y^2)}{\cancel{2xy^3}} \\ & \frac{4x^4-5y^2}{y^3} \end{aligned}$$

Notes

$$\begin{aligned} \textcircled{8} \quad & \frac{7x^2y}{12z^3} \cdot \frac{14z}{49xy^4} \\ & \frac{\cancel{7} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{2} \cdot \cancel{7} \cdot \cancel{z}}{\cancel{2} \cdot \cancel{2} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{7} \cdot \cancel{7} \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{y} \cdot \cancel{y}} \\ & \frac{x}{6y^3z^2} \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad & \frac{b+3}{4b-12} \cdot \frac{b^2-4b+3}{b^2-7b-30} \\ & \frac{(\cancel{b+3})(\cancel{b-3})(b-1)}{4(\cancel{b-3})(b-10)(\cancel{b+3})} \\ & \frac{b-1}{4(b-10)} \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad & \frac{n^2+7n+12}{16n^2} \div \frac{n+3}{2n} \\ & \frac{n^2+7n+12}{16n^2} \cdot \frac{2n}{n+3} \\ & \frac{(\cancel{n+3})(n+4) \cdot \cancel{2} \cdot \cancel{n}}{\cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot \cancel{2} \cdot n \cdot \cancel{(n+3)}} \\ & \frac{n+4}{8n} \end{aligned}$$

Week Eight

Monday

$$\begin{aligned} \textcircled{1} \quad & 5y^2 - y - 4 = 0 \\ & x = \frac{-(-1) \pm \sqrt{(-1)^2 - (4 \cdot 5 \cdot -4)}}{2(5)} \end{aligned}$$

$$x = \frac{1 \pm \sqrt{1+80}}{10}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{1 \pm \sqrt{81}}{10}$$

$$x = \frac{1+9}{10}$$

$$x = 1$$

$$x = \frac{1-9}{10}$$

$$x = 0.8 \text{ page 40A}$$

Notes

$$(2) (3a^2 + 2a - 12) + (8a + 7 - 2a^2)$$

$$a^2 + 10a - 5$$

$$(3) \frac{4-2}{-8-6}$$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{4 + -2}{-8 + -6}$$

$$\frac{2}{-14}$$

$$\frac{-1}{7}$$

$$(4) x^2 + 7^2 = 20^2$$

$$x^2 + 49 = 400$$

$$\sqrt{x^2} = \sqrt{351}$$

$$x = 18.7$$

$$a^2 + b^2 = c^2$$

$$(5) \frac{g^3 h}{b}$$

complex fraction =
division

$$\frac{gh^3}{b^2}$$

$$\frac{g^3 h}{b} \div \frac{gh^3}{b^2}$$

$$\frac{g^3 h}{b} \cdot \frac{b^2}{gh^3}$$

$$\frac{g^2 b}{h^2}$$

$$(6) y = 3x - 7$$

$$3x - 7 = y$$

$$-y \quad -y$$

$$3x - y - 7 = 0$$

$$3x - y = 7$$

$$y = mx + b$$

$$Ax + By = C$$

slope-intercept

standard

Notes:

$$(7) d = \sqrt{(9-3)^2 + (16-4)^2}$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{6^2 + 12^2}$$

$$d = \sqrt{36 + 144}$$

$$d = \sqrt{180}$$

$$d \approx 13.4$$

$$(8) \begin{array}{r} 240 \\ 10\% = 24 \\ + 5\% = 13 \\ \hline 15\% = 39 \end{array}$$

To find 10%, move decimal
2 place left ... to find 5%,
half your 10% answer.
Add your 2 answers
together!

$$(9) \begin{array}{r} 3x + 5y = 11 \\ 5x - 5y = 25 \\ \hline \end{array}$$

Dist. Property

$$\begin{array}{r} 8x = 36 \\ \hline 8 \quad 8 \end{array}$$

$$x = 4.5$$

The "y's" cancel.
Solve for x

$$3(4.5) + 5y = 11$$

$$13.5 + 5y = 11$$

$$\begin{array}{r} -13.5 \quad -13.5 \end{array}$$

$$\begin{array}{r} 5y = -2.5 \\ \hline 5 \quad 5 \end{array}$$

$$y = -0.5$$

Substitute 4.5 and
solve for y

(10) hypotenuse
Wednesday

$$(1) \begin{array}{r} 5g - 8g + -8g \\ 5g + -16g \\ -11g \end{array}$$

Notes

Any value to the
zero power = 1

$$\begin{aligned} \textcircled{2} \quad & \frac{(16x^2y^{-1})^0}{(4x^0y^{-4}z)^{-2}} \\ & \frac{1}{4^{-2}y^8z^{-2}} \\ & \frac{4^2z^2}{y^8} \\ & \frac{16z^2}{y^8} \end{aligned}$$

Get rid of negative
exponents

$$\begin{aligned} \textcircled{3} \quad & P = 2(4x^2 + 2x - 1) + 2(2x^2 - x + 3) \quad P = 2l + 2w \\ & P = 8x^2 + 4x + -2 + 4x^2 + 2x + 6 \\ & P = 12x^2 + 2x + 4 \end{aligned}$$

$$\textcircled{4} \quad \frac{2x^2 - 4x}{x - 2}$$

1) Factor

$$\frac{2x(\cancel{x-2})}{(\cancel{x-2})} = 2x$$

2) Cancel like factors
in the numerator
and denominator.

No → it could be simplified!

$$\begin{aligned} \textcircled{5} \quad & \sqrt{180a^2b^3} \\ & \sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 5aabb} \\ & 18ab\sqrt{5b} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & \frac{5x + 15}{x^2 + 10x + 21} \\ & \frac{5(\cancel{x+3})}{(x+7)(\cancel{x+3})} \\ & \frac{5}{x+7} \end{aligned}$$

$$\begin{aligned} x &\neq -7 \\ x &\neq -3 \end{aligned}$$

Set exclusions
for $x+7$
 $x+3$

No zero in denom!

$$\textcircled{7} \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\textcircled{8} \quad \frac{7}{8} = \frac{x}{100}$$

$$\frac{700}{8} = \frac{8x}{8}$$

$$87.5\% = x$$

$$\textcircled{9} \quad \frac{8^2}{\cancel{x^2}} \cdot \frac{\cancel{x^4}}{4x} \cdot \frac{2x}{1}$$

use cancellation!

$$\textcircled{10} \quad \frac{1}{3} \quad 2x$$

perpendicular lines have
opposite reciprocal slopes

Friday:

$$\textcircled{1} \quad \begin{array}{c} x \\ x \\ 2x \end{array}$$

sum of the angles
of a $\Delta = 180^\circ$

$$x + x + 2x = 180$$

$$4x = 180$$

$$x = 45^\circ$$

$$45^\circ - 45^\circ - 90^\circ$$

$$\textcircled{2} \quad 18a^1b^1c^1d^1e^6$$

10th degree

$$1+1+1+1+6$$

add variable exponents!

$$\textcircled{3} \quad \sqrt{x+3} = \sqrt{5}$$

$$(\sqrt{x+3})^2 = (\sqrt{5})^2$$

$$x+3=5$$

$$x=2$$

square both sides

solve

$$\textcircled{4} \quad A = lw$$

$$A = (6b^3c)(5bc^2)$$

$$A = 30b^4c^2 \text{ units}^2$$

Notes

$$y = mx + b$$

$\downarrow$ $\downarrow$
 slope y -intercept

⑤ $y = \frac{9}{10}x - 10$

⑥ $36, 12, 4,$
 $\div 3 \quad \div 3$

$\frac{4}{3}, \frac{4}{9}, \frac{4}{27}$

$\frac{4}{3} = \frac{4}{3}$

$\frac{4}{3} \div 3 = \frac{4}{3} \cdot \frac{1}{3} = \frac{4}{9}$

$\frac{4}{9} \div 3 = \frac{4}{9} \cdot \frac{1}{3} = \frac{4}{27}$

⑦ $(6a - 2b)(9a + b)$

$54a^2 + 6ab - 18ab - 2b^2$

$54a^2 - 12ab - 2b^2$

⑧ $\left(\frac{-3}{4}c\right)^3$

$\left(\frac{-3}{4}c\right)\left(\frac{-3}{4}c\right)\left(\frac{-3}{4}c\right)$

$\frac{-27}{64}c^3$

⑨ all real numbers

⑩ $3(2k - 2) = -2(4k - 11)$

$6k + -6 = -8k + 22$

$8k \quad 8k$

$14k + -6 = 22$

$6 \quad 6$

$14k = 28$

$14 \quad 14$

$k = 2$