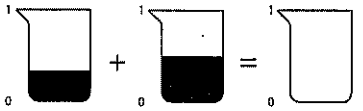
Practice Final Exam

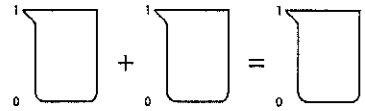
Assessment

Solve. Show your work.

Fill in the beakers and/or blanks.

☐ Know it
☐ Need practice
☐ Confused





1. $\frac{1}{3} \times \frac{1}{2} = \frac{5/6}{\frac{2}{6}+\frac{3}{6}}$

① multiply denominator ② cross multiply

2. .25 + .50 = .75

☐ Know it
☐ Need practice
☐ Confused

3. Circle the player with the higher rate.

Jan: 18 out of 36 $\frac{18}{36} = .5$

(Dean:) 8 out of 9 $\frac{.8}{9} = .88$

Use the Distributive Property of Multiplication over Addition and Base-Ten to solve these problems.

☐ Know it
☐ Need practice
☐ Confused

4. A movie theater worker sells large buckets of popcorn for $6 each. She sold 13 buckets of popcorn in 30 minutes. How much money did she collect?

13 • 6

(10 + 3) • 6

60 + 18

78

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

☐ Know it
☐ Need practice
☐ Confused

5. Gian and Lila are baking wedding cakes. Gian's cake was 8 layers high, and Lila's cake was 4 layers high. How many more layers did Gian's cake have than Lila's?

~~Draw a bar model~~:

~~What type of problem is this?~~ _____

Is it addition or subtraction? subtraction

Write an equation for the problem: $8 - 4 = 4$

For problem 6, circle the OPERATION that is being used to solve the problem. Then, circle the STRUCTURE that is being used to solve the problem. Finally, solve the problem and write your answer on the line.

☐ Know it
☐ Need practice
☐ Confused

6. Tricia has 93 numbers on her cell phone. Bianca has 27 phone numbers in her cell phone. How many numbers do they have total?

$93 + 27 = 120$

~~**Addition:**~~	~~**Subtraction:**~~
~~Join/part-part-whole~~	~~Classic take-away~~
~~Start unknown~~	~~Comparison~~
~~Compare-total unknown~~	~~Deficit/missing amount~~

☐ Know it
☐ Need practice
☐ Confused

7. Simplify: $-300 \div -6 =$ 50

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

☐ Know it
☐ Need practice
☐ Confused

8. You have $170 in your bank account. You have been saving for 9 months. About how much are you saving each month? (estimate)

Round to $180

$20 a month

$\frac{\$180}{9} = \$20$

Use the strategies that you've learned (associative property, opposite pairs, and the identity property) to solve.

☐ Know it
☐ Need practice
☐ Confused

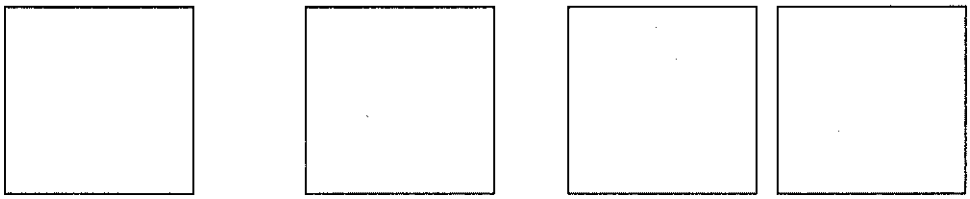
9. $16 - 10 - 6 + 93 =$ 93

$6 - 6 + 93$

Shade each box according to the fraction shown. Rewrite each fraction using the lowest common denominator (unit whole). Add the fractions and shade the answer boxes. Then write your answer in simplified form on the line.

☐ Know it
☐ Need practice
☐ Confused

10.



$\frac{1}{2} + \frac{5}{6} =$

$\frac{6}{12} + \frac{10}{12} = \frac{16}{12}$

Simplified form: $\frac{16}{12} \div \frac{4}{4} = \frac{4}{3}$

① multiply the denominators 2.6

② cross multiply for new numerators 6.1 and 5.2

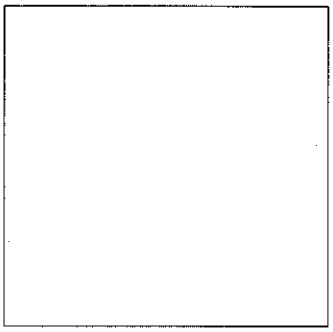
continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Multiply the fraction using the algorithm for multiplying fractions. Write your answer on the line. Then shade the unit square multiplication blank to represent the given fractions and show your answer.



☐ Know it
☐ Need practice
☐ Confused

11. $\frac{1}{4} \bullet \frac{2}{3} = \frac{2}{12}$

Use the order of operations to solve problems 12–13. Write your answer on the line and show your work.

☐ Know it
☐ Need practice
☐ Confused

12. $18 + 50 - 10 \bullet 3 =$ 38

$18 + 50 - 30$
$68 - 30$

☐ Know it
☐ Need practice
☐ Confused

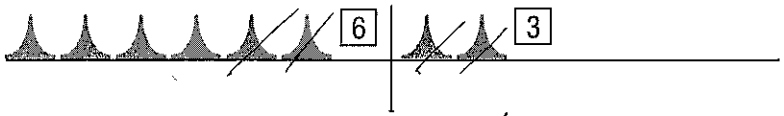
13. $6 \bullet (2 \div 2 \bullet 8) =$ 48

$6(1 \cdot 8)$

Solve for *x*. Write your answer on the line.

☐ Know it
☐ Need practice
☐ Confused

14.



Equation: $6x+6=2x+3$ $x =$ $-3/4$ Check: $1.5 = 1.5$

$6x+6=2x+3$
$-2x \quad -2x$
$4x+6=3$
$-6 \quad -6$
$\frac{4x}{4} = \frac{-3}{4}$

$6x+6=2x+3$
$6(-3/4)+6 = 2(-3/4)+3$
$\frac{-18}{4}+6 = \frac{-6}{4}+3$
$1.5 = 1.5$

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Represent each equation using shaded triangles and boxed numbers. Cross off any pawns that do not belong in the setup. Use arrows to show legal moves. Find the value of x and check your work.

☐ Know it ☐ Need practice ☐ Confused

15. $x + 1 = 2x + 9$

$-x \quad -x$

$1 = x + 9$

$-9 \quad -9$

$x = -8$

Check: $-7 = -7$

Check:

$-8 + 1 = 2(-8) + 9$

$-7 = -16 + 9$

$-7 = -7$

☐ Know it ☐ Need practice ☐ Confused

16. $6x + 4 = 3x + 13$

$-3x \quad -3x$

$3x + 4 = 13$

$-4 \quad -4$

$\frac{3x}{3} = \frac{9}{3} = 3$

$x = 3$

Check: $22 = 22$

Check:

$6(3) + 4 = 3(3) + 13$

$18 + 4 = 9 + 13$

$22 = 22$

☐ Know it ☐ Need practice ☐ Confused

17. $8x - 2x + 4 = x + 14$

$6x + 4 = x + 14$

$-x \quad -x$

$5x + 4 = 14$

$-4 \quad -4$

$5x = 10$

$x = 2$

Check: $16 = 16$

Check:

$8(2) - 2(2) + 4 = 2 + 14$

$16 - 4 + 4 = 16$

$16 = 16$

☐ Know it ☐ Need practice ☐ Confused

18. $16 + x + 2 = 2(x + 5)$

$18 + x = 2x + 10$

$-x \quad -x$

$18 = x + 10$

$-10 \quad -10$

$x = 8$

Check: $26 = 26$

Check:

$16 + 8 + 2 = 2(8 + 5)$

$26 = 2(13)$

$26 = 26$

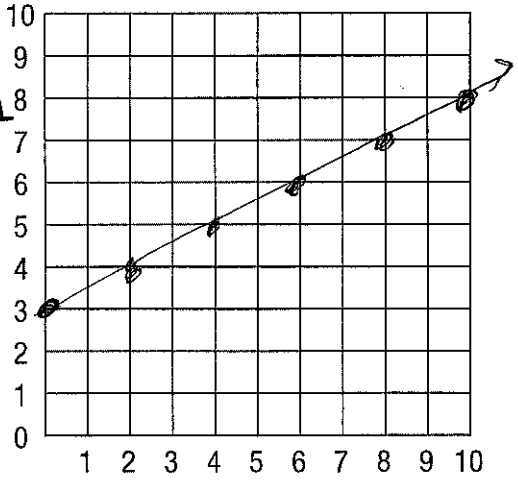
Complete the table below, then graph it. Then write the equation for the graph on the line.

☐ Know it ☐ Need practice ☐ Confused

19.

x	___ • x + ___	y
0	$\frac{1}{2}x + 3$	3
2	$\frac{1}{2}(2) + 3$	4
4	$\frac{1}{2}(4) + 3$	5
6	$\frac{1}{2}(6) + 3$	6
8	$\frac{1}{2}(8) + 3$	7
10	$\frac{1}{2}(10) + 3$	8

2 | 1



① Plot points

② Find change in y values = 1

③ Find change in x values = 2

④ Slope is $\frac{1}{2}$

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

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

20. Use what you know about graphs, modeling equations, and tables to solve.

Verbal:

You rent a sailboat while on vacation. Each day you use the boat is $50, and you use the boat for 7 days. There is also a flat fee that you must pay to keep the boat at a dock near your hotel. When you go to pay your bill, you find that you owe $550. How much was the flat fee to keep the boat at the dock?

$y = mx + b$
$550 = 50(7) + b$
$550 = 350 + b$
$-350 \quad -350$
$200 = b$

Algebraic: $y = 50x + 200$

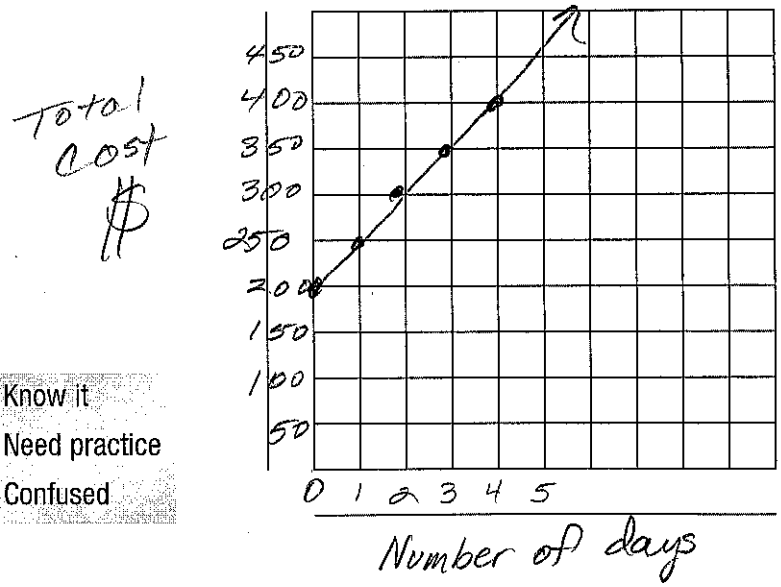
~~Point:~~ _____ ~~Slope:~~ _____

~~Meaning of slope:~~ _____

Table:

# of days (x)	Function: $50x + 200$	Total Cost (y)
0	$50(0) + 200$	$200
1	$50(1) + 200$	$250
2	$50(2) + 200$	$300
3	$50(3) + 200$	$350
4	$50(4) + 200$	$400

Graph:



☐ Know it
☐ Need practice
☐ Confused

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

☐ Know it
☐ Need practice
☐ Confused

24. The stem-and-leaf plot shows the weights in pounds of a variety of shipments made from a shipping company on one day.

Stem	Leaf
5	1 3 9
6	2 7
7	7 8 9
8	0 2 3 3 3 3 3 4 4 5 6 7
9	1 2 2
10	2 6
11	1 8
12	2 4
13	3

Key: 5|3 represents 53

a. How much did the lightest package weigh? 51 lbs

b. How much did the heaviest package weigh? 133 lbs

c. What was the median weight? 83.5

d. What is the mode? 83

Solve problem 25 using the Distributive Property and grids. Put partial products in the grid.

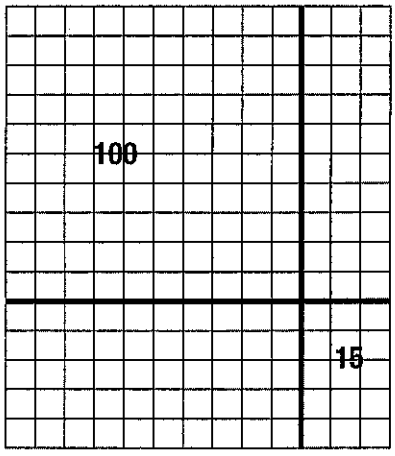
25. 15 • 13

$(\underset{\text{tens}}{10} + \underset{\text{ones}}{5}) \bullet (\underset{\text{tens}}{10} + \underset{\text{ones}}{3})$

$100 + 30 + 50 + 15$

195

☐ Know it
☐ Need practice
☐ Confused



continued

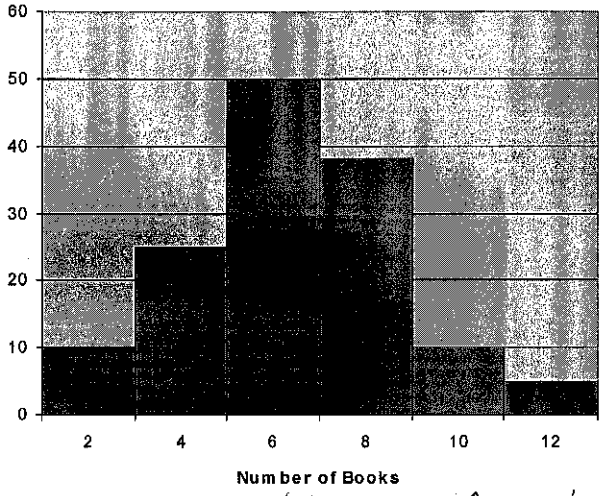
NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

☐ Know it
☐ Need practice
☐ Confused

26. The histogram below shows the number of books read over the summer by seniors at a local high school.



a. What is the mode of the data? (number of books) 6

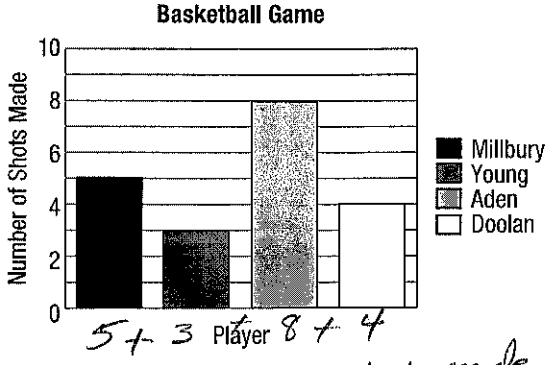
b. What is the greatest number of books any senior read over the summer? 12

c. Make one observation about the data based on the histogram.

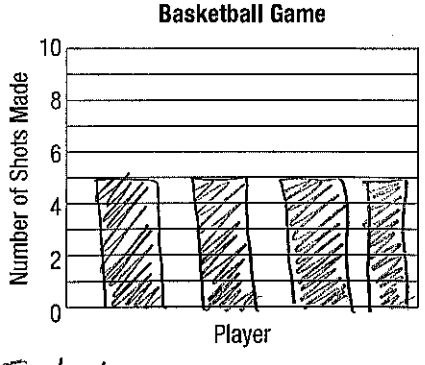
Answers will vary; 50 students read 6 books over the summer

☐ Know it
☐ Need practice
☐ Confused

27. The graph on the left shows the number of shots four players took in a basketball game. Use the blank graph on the right to show what the first graph would look like if the players had taken the same number of shots.



5 + 3 8 + 4

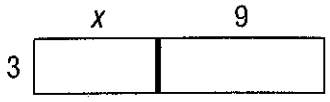


20 shots made / 4 players = 5 shots

☐ Know it
☐ Need practice
☐ Confused

28. $3(x + 9)$

3x+27



continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Use the basketball statistics table below to answer the questions.

Player	Points	Free Throws Attempted	Free Throws Made	Free Throw %
Emma Longfellow	35	3	2	65%
Amy Gallagher	25	1	1	100%
Quinn Flynn	16	2	0	0%

☐ Know it
☐ Need practice
☐ Confused

29. Who made the most free throw attempts? Emma

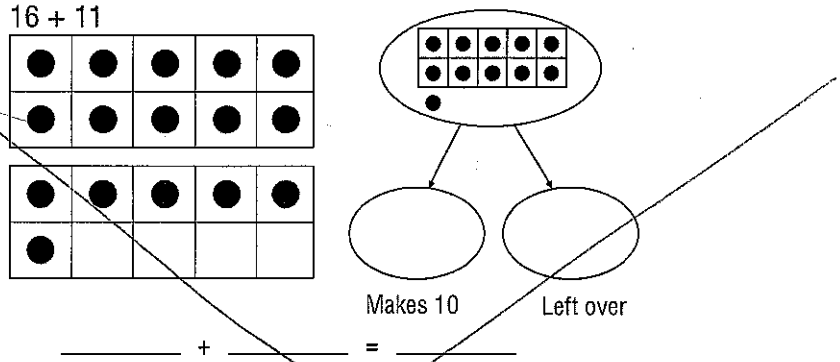
☐ Know it
☐ Need practice
☐ Confused

30. Who had the highest rate of making free throws? Amy

Use the graphic organizers to solve these problems. Decompose your second addend to make a ten.

☐ Know it
☐ Need practice
☐ Confused

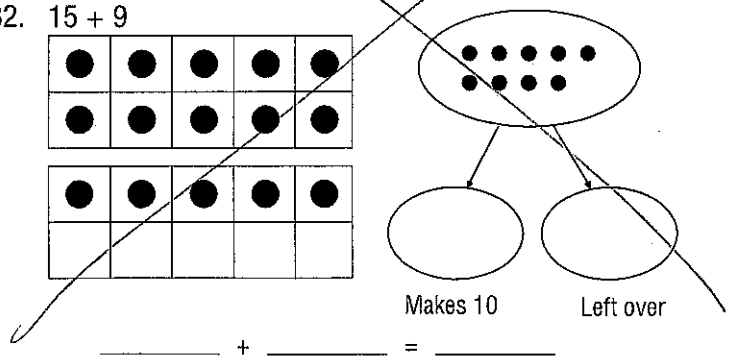
31. 16 + 11



_____ + _____ = _____

☐ Know it
☐ Need practice
☐ Confused

32. 15 + 9



_____ + _____ = _____

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Use the Distributive Property of Multiplication over Addition and Base-Ten to solve.

☐ Know it
☐ Need practice
☐ Confused

33. You're selling handmade scarves. You have 27 scarves, and you're charging $8 each. How much money will you make if you sell all 27 scarves?

27 • 8

(20 + 7) • 8

20 • 8 + 7 • 8

160 + 56

216

Answer: 216

Look at each set of fractions. Are they equivalent? Use what you know about proportions to decide. Write *yes* or *no* on the line.

☐ Know it
☐ Need practice
☐ Confused

34. $\frac{1}{10}$ ~~and~~ $\frac{4}{5}$ no

$40 \neq 5$

☐ Know it
☐ Need practice
☐ Confused

35. $\frac{6}{60}$ ~~and~~ $\frac{80}{100}$ no

$600 \neq 4800$

Find the amount of change, the ratio, and the percent change for the problem below. Circle whether the change represents an increase or a decrease. Write the percent change as a percent.

☐ Know it
☐ Need practice
☐ Confused

36. The Bath Stuff Store had 16 pumpkin candles on the shelf yesterday. Today there are only 8. What is the percent change in the number of pumpkin candles?

Amount of change: 16 − 8 = 8

Percent change: 50%

Ratio: $\frac{\text{change}}{\text{original}} = \frac{8}{16}$

Increase or (decrease) (circle one)

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Write an equation for the word problem below using the given information. Then solve for *x*.

☐ Know it
☐ Need practice
☐ Confused

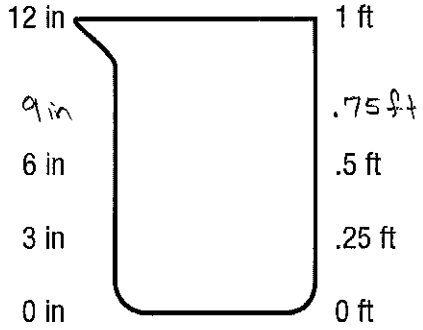
37. 6 more than 3 times a number is 36. What is the number?

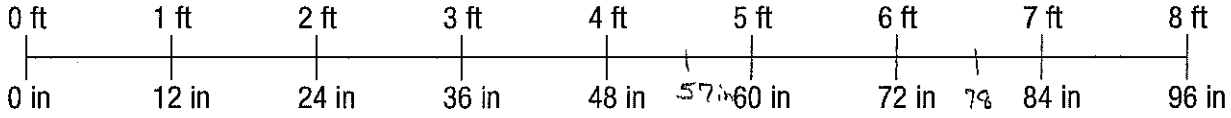
Equation: $6 + 3x = 36$

Answer: 10

$3x + 6 = 36$
$-6 \quad -6$
$\frac{3x}{3} = \frac{30}{3}$

Convert the measurements for each item from inches to feet. Write your answers on the lines.





☐ Know it
☐ Need practice
☐ Confused

38. A door is . . .

57 inches wide = 4 feet 9 inches = 4.75 feet

78 inches long = 6 feet 6 inches = 6.5 feet

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Your favorite outlet is having a 15% off everything sale. Figure out the sale price for each item below by using 10% and rounding, and then by using proportions. Show your work.

☐ Know it
☐ Need practice
☐ Confused

39. A purse that costs $138 is on sale for 15% off. Use 10% and rounding to find the approximate sale price.

$138 is about 140

10% = 14 5% = 7

10% + 5% = 14 + 7 = ≈ 21 discount

Original price – discount = cost

140 – 21 = #119

Approximate sale price: #119

☐ Know it
☐ Need practice
☐ Confused

40. Use proportions to find the exact sale price for the same $138 purse.

part $\frac{X}{138} = \frac{15}{100}$
whole

138 • 15 = 100 • X

$138(15) = 100x$

$\frac{2070}{100} = \frac{100x}{100}$

$20.70

Exact discount: $20.70

Exact sale price: #117.30

#138 – 20.70

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

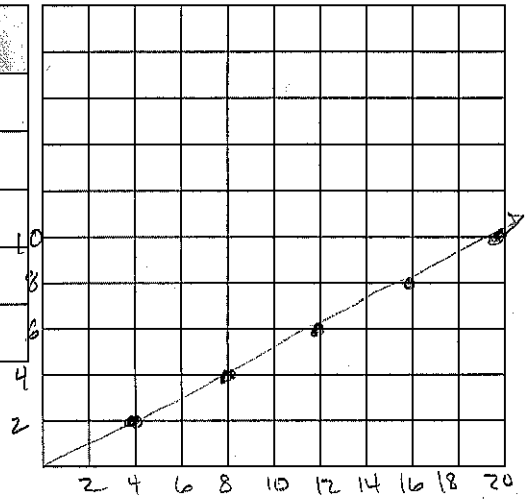
Use $\frac{\Delta y}{\Delta x}$ to determine the slope for the points graphed below.

☐ Know it
☐ Need practice
☐ Confused

41. Table

x	y
4	2
8	4
12	6
16	8
20	10

Graph



Slope

change in y / change in x $\frac{\Delta y}{\Delta x} = \frac{2}{4} = \frac{1}{2}$

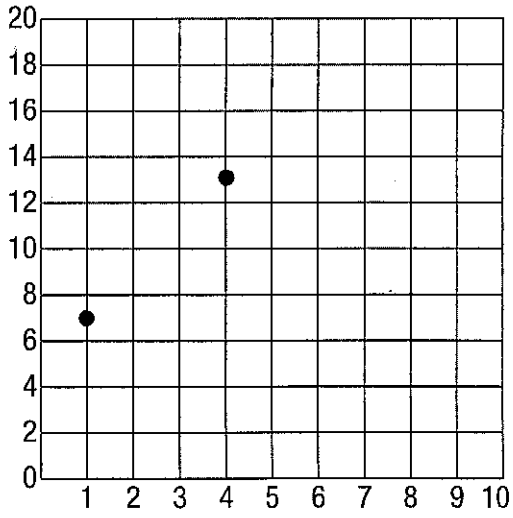
~~Algebraic~~

☐ Know it
☐ Need practice
☐ Confused

42. Table

(x)	(y)
1	7
4	13

Graph



Slope

$\frac{\Delta y}{\Delta x} = \frac{6}{3} = 2$

Algebraic

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Figure out where the rational number "lives" on the number line. Use the measuring cups or the circles to help you. Then do the following:

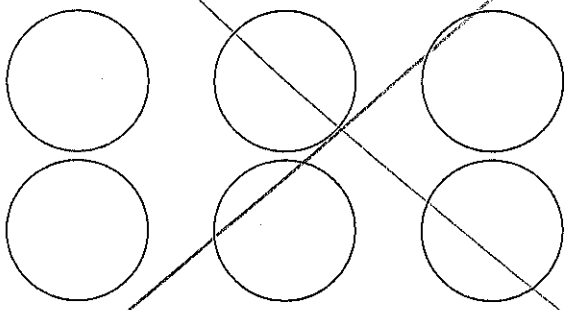
a. Use a calculator to simplify the expression with the rational number.

b. Use a calculator to simplify the expression with your approximate whole number.

c. Check if your answers are close by plotting them both on the number line.

☐ Know it
☐ Need practice
☐ Confused

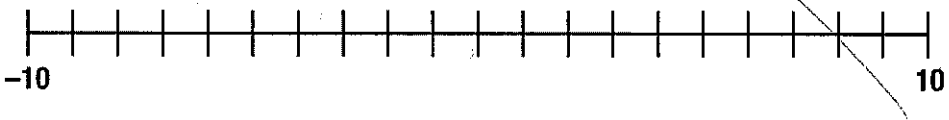
49. $3 + \frac{7}{8}; \frac{7}{8}$ is very close to _____



Correct answer: _____

Close approximation: _____

Plot your rational number and the approximate whole number on the number line:

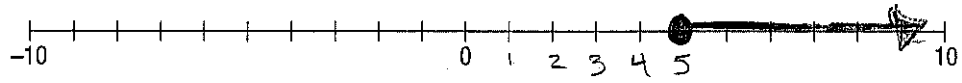


Are your answers close? _____

Solve each inequality for x. Then graph it.

☐ Know it
☐ Need practice
☐ Confused

50. $3x + 5 \geq 20$



$3x + 5 \geq 20$
$-5 \quad -5$

$\frac{3x}{3} \geq \frac{15}{3}$

$x \geq 5$

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

For problem 51, use the information to create box plots for each set of data. Then, compare the box plots to answer the questions.

☐ Know it
☐ Need practice
☐ Confused

51. Petra has been bowling for 20 years. Here are her scores for the first 15 games bowled in the Ladies' Night Out League:

193, 201, 213, 203, 237, 196, 197, 196, 217, 199, 194, 207, 208, 205, 229

Calculator instructions
Stat
Edit - put data in L_1
Stat
Calc
1-Variable Stats
Scroll down

Gia is bowling in the Ladies' Night Out League for only her second year. Below are her scores for the first 15 games of the league:

105, 130, 112, 117, 124, 99, 110, 93, 122, 130, 131, 112, 109, 144, 132

a. Fill out the five-number summaries below for each of the bowlers' scores.

Petra:

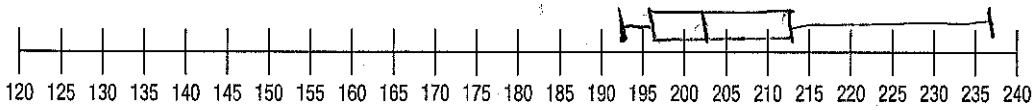
Minimum	193
Lower Quartile (Q1)	196
Median	203
Upper Quartile (Q3)	213
Maximum	237

Gia:

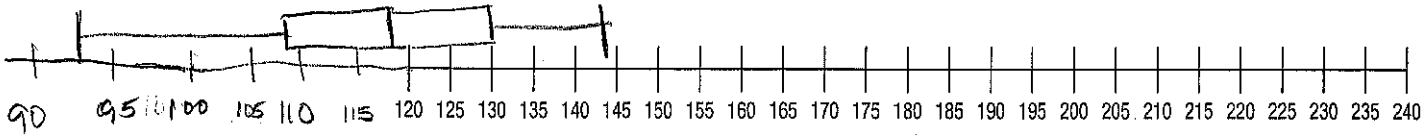
Minimum	93
Lower Quartile (Q1)	109
Median	117
Upper Quartile (Q3)	130
Maximum	144

b. Now use the five-number summaries to draw box-and-whisker plots.

Petra's box plot



Gia's box plot



Now use the two box-and-whisker plots you created to answer the following questions.

c. What do you notice when you first glance at these two box-and-whisker plots?

Petra's scores are much higher

continued

d. Does this make sense? Why or why not?
Yes, Petra has been bowling for 20 years

e. Does having a lot more experience in bowling leagues mean that you will always bowl a higher game compared to someone who is just starting?
Not necessarily

f. What can you conclude about these two box-and-whisker plots?
Petra's box and whisker plot is skewed and Gia's is mound shaped

☐ Know it
☐ Need practice
☐ Confused

52. Data set:

36, 43, 45, 49, 51, 52, 55, 56, 57, 57, 57, 58, 58, 58, 60, 61, 61, 64, 92

a. Fill out the five-number summary:

Minimum (min)	36
Lower quartile (Q_1)	51
Median (M or Q_2)	57
Upper quartile (Q_3)	60
Maximum	92

b. What's the interquartile range?

$IQR = Q_3 - Q_1 =$ 60 − 51 = 9

c. Multiply the interquartile range by 1.5.

$IQR \bullet 1.5 =$ 9 • 1.5 = 13.5

d. **Subtract** this answer from the **lower quartile.**

$Q_1 -$ 13.5 = 37.5

e. **Add** the answer from part c to the **upper quartile.**

$Q_3 +$ 13.5 = 73.5

f. What are your outliers, if any? 36 and 92 are outliers

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

For problem 53, tell whether the number is rational or irrational by circling the correct choice. Then explain your reasoning.

☐ Know it
☐ Need practice
☐ Confused

53. –5432 (rational) irrational

Explanation: integers are not fractions that have non-terminating decimals

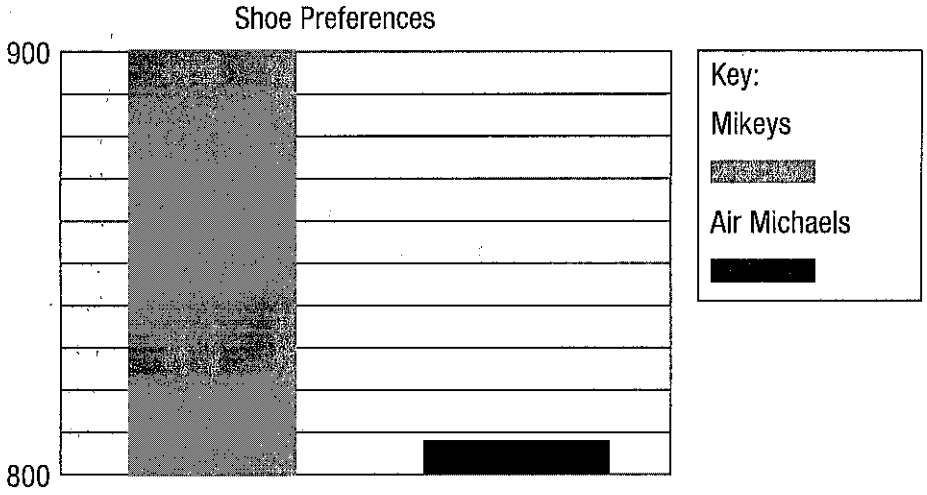
Solve. Show your work.

☐ Know it
☐ Need practice
☐ Confused

54.
$$\begin{array}{r} -17x^2 - 5x + 7 \\ +\ (10x^2 - 8x + 2) \\ \hline -7x^2 - 13x + 9 \end{array}$$

☐ Know it
☐ Need practice
☐ Confused

55. Explain why this graph is misleading.



The graph appears to have significantly more students that buy Mikeys; the scale factor is misleading

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Explain what is wrong with the sampling method or survey question.

☐ Know it
☐ Need practice
☐ Confused

56. Maria conducted a survey to determine how many people in town have pets. She polled people coming out of a pet supply store. What's wrong with this method?

biased

Simplify the equation, and write your answer on the line. Then, label your answer as *monomial*, *binomial*, or *trinomial*.

☐ Know it
☐ Need practice
☐ Confused

57. $(-6y^2 - 4y + 3) + (3y^2 - 4y - 3) =$ $-3y^2 - 8y$

Monomial, binomial, or trinomial? binomial

Multiply or divide the polynomials. Write your answer on the line.

☐ Know it
☐ Need practice
☐ Confused

58. $(-2x^3y^4)(10x^3y^2) =$ $-20x^6y^6$

add exponents when multiplying the same base

$x^3 \cdot x^3 = x^{3+3=6}$ $y^4 \cdot y^2 = y^{4+2} = y^6$

The survey question below is a leading question. Rewrite it so that it isn't leading.

☐ Know it
☐ Need practice
☐ Confused

59. Do you disagree with the statement that logging is destroying our beautiful rain forests and should be stopped?

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

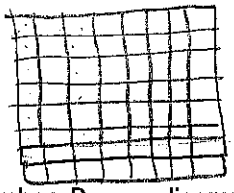
Assessment

Square the number below. ~~Draw a diagram to illustrate the square number.~~

☐ Know it
☐ Need practice
☐ Confused

60. 8

$8^2 = 64$



Find the square root of the following number. ~~Draw a diagram to help you figure out the square root.~~

☐ Know it
☐ Need practice
☐ Confused

61. 144

$\sqrt{144} = 12$

Find the square roots of the following number. If it is a perfect square, give the square root as a whole number. If it is not a perfect square, list the two numbers that the square root falls between, and an *estimate* of the square root.

☐ Know it
☐ Need practice
☐ Confused

62. 102

Perfect square? Yes _____ No ✓

If **yes,** what is the square root? _____

If **no,** what numbers does the square root fall between? 10 and 11

If **no,** what is an estimate of the square root? 10.09

~~Draw a picture to illustrate your answer.~~

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Find the square roots of the following numbers. If it is a perfect square, give the square root as a whole number. If it is not a perfect square, show how it is the product of a square number and another number, and identify its *exact* square root.

☐ Know it
☐ Need practice
☐ Confused

63. 24

Perfect square? Yes _____ No ✓

If **yes,** what is the square root? _____

If **no,** what numbers is it a product of? Fill in the blanks below.

$\sqrt{4 \cdot 6}$ What is the square root? $2\sqrt{6}$

~~Draw a picture to illustrate.~~

☐ Know it
☐ Need practice
☐ Confused

64. Are the following like radicals? $\sqrt{12}$ and $6\sqrt{12}$ Yes ✓ No _____

Determine if the following pair of radicals below can be combined. If so, combine them. Show your work.

☐ Know it
☐ Need practice
☐ Confused

65. $\sqrt{8}$ and $3\sqrt{2}$

↑ simplify to combine

$\sqrt{8}$

$\sqrt{4} \cdot \sqrt{2}$

$2\sqrt{2} + 3\sqrt{2} = \boxed{5\sqrt{2}}$

Simplify. Show your work.

☐ Know it
☐ Need practice
☐ Confused

66. $3\sqrt{90}$

$\times \sqrt{9}\ \sqrt{10}$

3

$\boxed{9\sqrt{10}}$

continued

NAME:

INTRODUCTION TO HIGH SCHOOL MATH
Practice Final Exam

Assessment

Simplify, then add or subtract. Show your work.

☐ Know it
☐ Need practice
☐ Confused

67. $2\sqrt{20} + 4\sqrt{5} =$ $8\sqrt{5}$

$\times \sqrt{4}\sqrt{5}$

2

$4\sqrt{5} + 4\sqrt{5}$

Solve each of the following problems. You may draw on graph paper and/or use a calculator to help you solve the problems. No matter what strategy you use, make sure to show your work on this paper.

☐ Know it
☐ Need practice
☐ Confused

68. If given leg $a = 6$ and the hypotenuse = 10, find leg b.

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

$6^2 + b^2 = 10^2$

$36 + b^2 = 100$

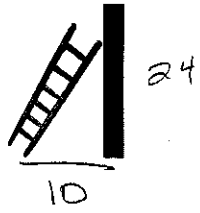
$-36 \qquad -36$

$b^2 = 64$

$b = \sqrt{64} = \boxed{8}$

☐ Know it
☐ Need practice
☐ Confused

69. A ladder is leaning against a wall. The foot of the ladder is 10 feet from the wall and the top of the ladder is resting 24 feet up on the wall. How long is the ladder?



$10^2 + 24^2 = c^2$

$100 + 576 = c^2$

$676 = c^2$

$\sqrt{676} = c$

$26 = c$