Name: _____ Date: _____

2.1 Warm Up

1. Circle the larger number.

a) 1.1 1.2 **b)** −10 −1

2. Change the fractions to decimal numbers.

a) $\frac{1}{2}$

$= \_\_\_\_ \div \_\_\_\_$

$= \_\_\_\_$

b) $\frac{3}{5}$

Tens	Ones	.	Tenths	Hundredths

3. Change the decimal numbers to fractions.

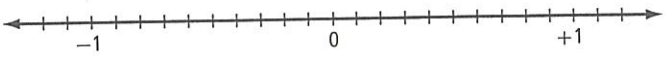
a) 0.3

The 3 is in the tenths place so the denominator is 10.

$= \frac{\square}{10}$

b) 0.85

4. **a)** Plot −0.5, −1, 0.3, and 1.2 on the number line.



b) Write the numbers in ascending order (smallest to largest): _____

5. Make equivalent fractions.

a) $\frac{2}{3} = \frac{\square}{\square}$ (× _____ above, × _____ below)

b) $\frac{8}{12} = \frac{\square}{\square}$ (÷ _____ above, ÷ _____ below)

6. Write the opposite of each number.

Opposite numbers have the same numeral but different signs.

a) −5 → _____

b) 3.4 → _____

c) $\frac{3}{4} \rightarrow \frac{\square}{\square}$

d) $-\frac{2}{5} \rightarrow \frac{\square}{\square}$

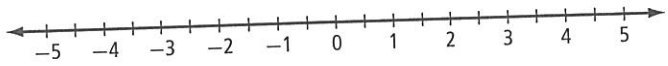
2.1 Expectation 1

Name: _____ Date: _____

Check Your Understanding

Communicate the Ideas

1. Use a number line to show that $-\frac{1}{2}$ is greater than -3.



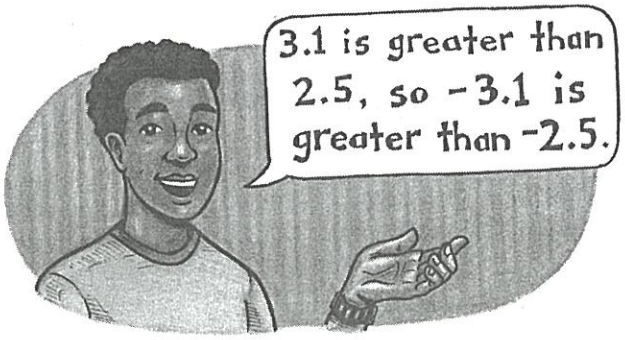
2. Is Dominic correct?

Circle YES or NO. Give 1 reason for your answer.

_____

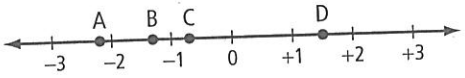
_____

_____



Practise

3. Match each rational number to a point on the number line.



a) $\frac{3}{2}$ _____

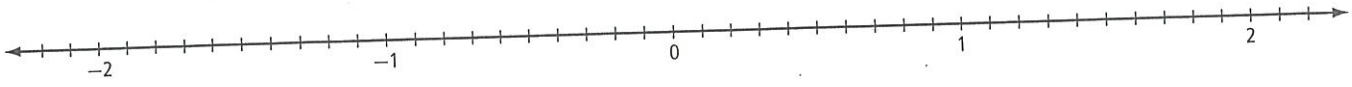
b) -0.7 _____

c) $-2\frac{1}{5}$ _____

d) $-1\frac{1}{3}$ _____

4. Plot $\frac{8}{9}, -0.4, 2\frac{1}{10}, -\frac{5}{3}$ on the number line.

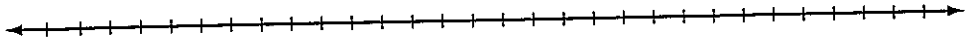
Change the fractions to decimal numbers.



Name: _____ Date: _____

5. Write $-\frac{3}{8}$, $1.\overline{8}$, $\frac{9}{5}$, $-\frac{1}{2}$, and -1 in descending order.

Write each number in decimal form.



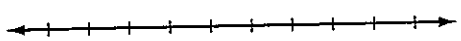
6. Write each fraction as an equivalent fraction.

a) $-\frac{2}{5} = \frac{\square}{\square}$

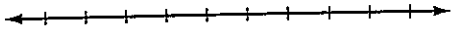
b) $\frac{10}{6} = \frac{\square}{\square}$

7. Which rational number in each pair is greater? Show your thinking.

a) $\frac{1}{5}, -1$



b) $-\frac{1}{2}, -\frac{3}{5}$



8. Write a decimal number between each pair of rational numbers.

Change each fraction to a decimal number.

a) $\frac{3}{5}, \frac{4}{5}$

b) $-\frac{1}{2}, -\frac{5}{8}$

Name: _____ Date: _____

9. Write a fraction between each pair of rational numbers.

Change each decimal to a fraction.

a) 0.2, 0.3

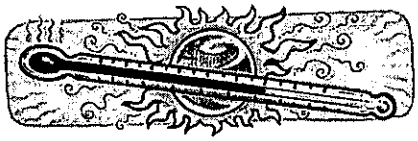
b) −0.52, −0.53

Apply

10. Rewrite each amount as a positive or negative number.

Example: "losing 2 dollars" = −2

a) a temperature increase of 8.2 °C = _____



b) growth of 2.9 cm = _____

c) 3.5 m below sea level = _____

d) earning $32.50 = _____

11. The table shows the average early-morning temperature for 7 communities in May.

Community	Average Early-Morning Temperature (°C)
Churchill, Manitoba	−5.1
Regina, Saskatchewan	3.9
Edmonton, Alberta	5.4
Penticton, British Columbia	6.1
Yellowknife, Northwest Territories	−0.1
Whitehorse, Yukon Territory	0.6
Resolute, Nunavut	−14.1

a) Write the temperatures in descending order.

highest to lowest

_____, _____, _____, _____, _____, _____, _____.

b) Which community has an average temperature between the values for Whitehorse and Churchill? _____

Name: _____ Date: _____

12. Write >, <, or = to make each statement true.

> means greater than.
< means less than.

To compare fractions, change them to decimals or equivalent fractions with a common denominator.

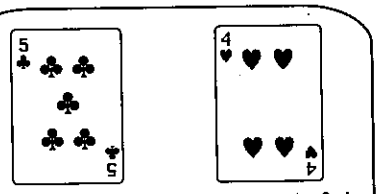
a) $\frac{-9}{6} \square \frac{3}{-2}$ **b)** $-\frac{3}{5} \square -0.\overline{6}$

c) $-3.25 \square -3\frac{1}{5}$ **d)** $-\frac{4}{7} \square -\frac{2}{3}$

Math Link

Play this card game with a partner.

- Remove the jokers, kings, queens, jacks, and 10s from the deck.
- Divide the cards between you and your partner.
- The numbered cards are decimals.
  Red is positive and black is negative.
  Example: A black 5 is -0.5. A red 4 is 0.4.



- The red aces are +1. The black aces are −1.
- Both players lay a card face up at the same time.
  The greatest value wins and the winner keeps both cards.
- If there is a tie, both players lay 2 more cards face down and then a card face up.
  Whichever card is greater wins all cards from that turn.
- The player who ends up with all the cards is the winner.

LO: I Expectation 2

INTEGER RULES

Addition

Same sign

Add the numbers and keep the sign
(-4) + (-5) = (-9)

Different sign

Subtract the two numbers and keep the sign of the higher number
(-10) + (+2) = (-8)

Subtraction

Keep	Change	Change
1st number	Subtraction to addition	The 2nd number to its opposite

Then follow the addition rules

(-9) - (+3) =

Therefore...

(-9) + (-3) = (-12)

Multiplication & Division

Same signs:
Positive answer

(-6) x (-5) = (+30)

Different signs:
Negative answer

(-12) ÷ (+3) = (-4)

Name: _____ Date: _____

2.2 Warm Up

1. Solve.

a) $5 + (-3) =$ _____

b) $(-10) + (-2) =$ _____

c) $(-4) - 2$

$= (\_\_\_\_\_) + (\_\_\_\_\_)$ Add the opposite.

$=$ _____

d) $7 - (-5)$

e) $3 \times (-2) =$ _____

⊕×⊕=⊕ ⊖×⊖=⊕
⊕×⊖=⊖ ⊖×⊕=⊖

f) $(-5) \times (-1) =$ _____

g) $(-8) \div (4) =$ _____

⊕÷⊕=⊕ ⊖÷⊖=⊕
⊕÷⊖=⊖ ⊖÷⊕=⊖

h) $(-15) \div (-3) =$ _____

2. Estimate and calculate.

a) $1.99 + 3.25$

Estimate: _____ + _____ = _____

Calculate:

$$\begin{array}{r} 1.99 \\ +3.25 \\ \hline \end{array}$$

b) $0.57 - 0.14$

Estimate:

Calculate:

c) 3.1×6.5

Estimate:

Calculate:

d) $9.6 \div 3.2$

Estimate:

Calculate:

3. Use the order of operations to solve.

a) $8 - 4 \div (-2)$

$= 8 - (\_\_\_\_\_)$

$= 8 +$ _____ Add the opposite.

$=$ _____

b) $(11 + 3) - 10 \div 2$

LG 1 Expectation a

Name: _____ Date: _____

Check Your Understanding

Communicate the Ideas

1. **a)** Do you think $-0.32 + 6.5$ will give a positive or negative answer? Give 1 reason for your answer.

_____

_____

b) Evaluate $-0.32 + 6.5$.

2. **a)** The products of these 2 expressions are _____.
(*the same* or *different*)

$2.54 \times (-4.22)$ -2.54×4.22

b) Give 1 reason for your answer.

_____

Practise

3. Estimate and calculate.

a) $0.9 + (-0.2)$

Estimate:

$\approx$ _____ + _____

$\approx$ _____

Calculate:

b) $0.34 + (-1.22)$

Estimate:

Calculate:

Name: _____ Date: _____

4. Estimate and calculate.

a) $5.46 - 3.16$

Estimate:

$\approx$ _____ $-$ _____

$\approx$ _____

Calculate:

b) $-1.49 - (-6.83)$

Estimate:

$\approx$ _____ $-$ (_____)

$\approx$ _____ $+$ (_____) Add the opposite.

$\approx$ _____

Calculate:

5. Estimate and calculate.

a) $2.7 \times (-3.2)$

Estimate:

Use the sign rules.

Calculate:

b) $-5.5 \times (-5.5)$

Estimate:

Calculate:

6. Estimate and calculate.

a) $(-40.4) \div (-4.04)$

Estimate:

Calculate:

b) $-3.25 \div 2.5$

Estimate:

Calculate:

Name: _____ Date: _____

7. Evaluate. Use the order of operations.

a) $-2.1 \times 3.2 + 4.3 \times (-1.5)$

$= (\_\_\_\_\_) + (\_\_\_\_\_)$

$= \_\_\_\_\_$

b) $-1.1[2.3 - (-0.5)]$

When there is more than 1 set of brackets, use square brackets.

$= -1.1 \times [2.3 + \_\_\_\_\_]$ Add the opposite.

$= -1.1 \times \_\_\_\_\_$

$= \_\_\_\_\_$

Apply

8. The temperature in Kelowna went from −2.2 °C to −11.0 °C in 4 h.
How many degrees did the temperature drop per hour?

Temperature change = (_____) − (_____)

= _____

Total time = _____

Average temperature drop = $\frac{\text{temperature change}}{\text{total number of hours}}$

Sentence: _____

9. A pelican dives vertically from a height of 3.8 m above the water.
It then catches a fish 2.3 m underwater.
Sketch a diagram of the situation.

a) Write an expression using rational numbers to show the length of the pelican's dive.

Distance down to the water = _____

Distance from the top of the water to the fish = _____

Expression: _____

b) How far did the pelican dive?

Solve the expression.

Sentence: _____

Name: _____ Date: _____

10. A submarine was cruising at a depth of 304.5 m. It then rose at 10.5 m per minute. How many minutes did it take to reach the surface?

Sentence: _____

11. A company made a profit of $8.6 million in its first year. It lost $5.9 million in its second year. It lost another $6.3 million in its third year.

a) After 3 years, did the company make or lose money? Show your calculations.

Sentence: _____

b) What was the average amount of money the company made or lost per year?

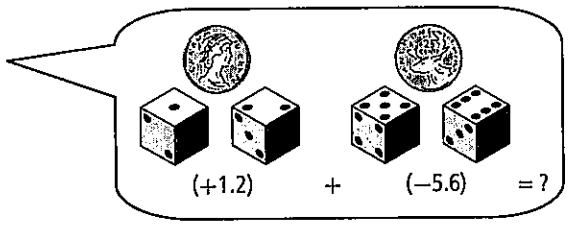
$$\text{Average} = \frac{\text{sum of numbers}}{\text{number of years}}$$

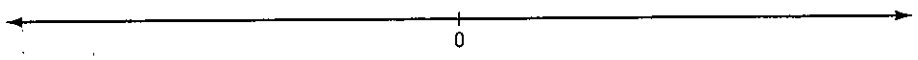
Sentence: _____

Math Link

Play this game with a partner. You will need 2 dice and 1 coin.

- Roll 2 dice, one at a time. The numbers on the dice create a decimal number. Example: rolling 6, then 5 means 6.5.
- Toss the coin. Tossing heads means the rational number is positive. Tossing tails means the rational number is negative.
- Roll the dice and toss the coin again to get your second number.
- Add the 2 numbers.
- The person with the sum closest to 0 wins 2 points. If there is a tie, each person wins 1 point.
- The first player to reach 10 points wins.

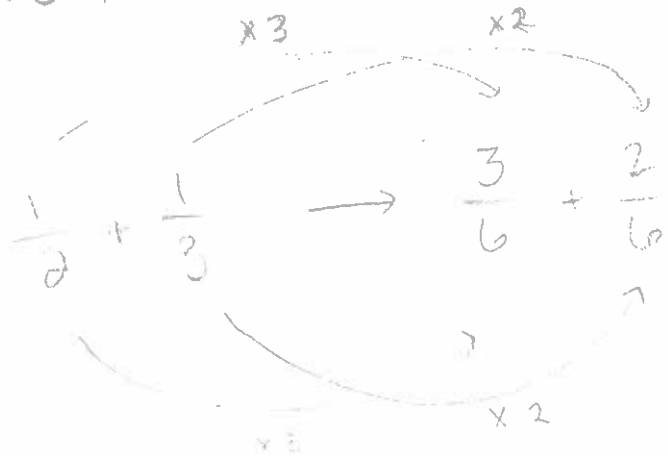




(9) LG 1 Exp 3

Fraction Rules

ADDING & SUBTRACTING → need the same denominator



MULTIPLY → multiply numerators

$\frac{2}{4} \times \frac{1}{3} = \frac{2}{12}$

→ multiply denominator

DIVISION → multiply reciprical ← flip the second fraction

$\frac{2}{5} \div \frac{3}{15} \rightarrow \frac{2}{5} \times \frac{15}{3} = \frac{30}{15}$

★ lowest terms (reduce)

$\frac{12}{16} \overset{\div 4}{=} \frac{3}{4}$ (÷4 on the denominator)

need to ÷ the numerator and denominator by the SAME number

Name: _____ Date: _____

2.3 Warm Up

1. Write the fractions in lowest terms.

a) $\frac{12}{15}$

÷ _____

$= \frac{\square}{\square}$

÷ _____

b) $\frac{10}{45}$

2. Change $4\frac{2}{3}$ to an improper fraction.

Example: $3\frac{1}{2} = \frac{3 \times 2 + 1}{2} = \frac{7}{2}$ *or* $3\frac{1}{2} = \frac{2}{2} + \frac{2}{2} + \frac{2}{2} + \frac{1}{2} = \frac{7}{2}$

3. Add or subtract. Write your answers in lowest terms.

a) $\frac{2}{5} + \frac{1}{2}$ Find a common denominator.

$= \frac{\square}{10} + \frac{\square}{10}$

$= \frac{\square + \square}{10}$

$= \frac{\square}{10}$

b) $2\frac{1}{3} - 1\frac{5}{6}$ Write as improper fractions.

4. Multiply or divide. Write your answers in lowest terms.

a) $3\frac{2}{5} \times 1\frac{1}{2}$ Change to improper fractions.

b) $2\frac{3}{4} \div 3\frac{1}{2}$

Name: _____ Date: _____

Show You Know

Stefano had \$50. He spent $\frac{1}{5}$ of it on a movie, $\frac{1}{2}$ on a round of golf, and $\frac{1}{10}$ on a snack. How much does he have left?

Movie: *Golf:* *Snack:*

$-\frac{1}{5} \times$ _____

Total amount spent: (_____) + (_____) + (_____) = _____

Find how much he has left.

Stefano has _____ left.

Check Your Understanding

Communicate the Ideas

1. **a)** Calculate $\frac{-3}{4} \div \frac{3}{8}$ using a common denominator and dividing the numerators.

b) Calculate $\frac{-3}{4} \div \frac{3}{8}$ by multiplying by the reciprocal.

c) Which method do you prefer? Give 1 reason for your answer.

Name: _____ Date: _____

Practise

2. Estimate and calculate.

a) $\frac{3}{8} - \left(-\frac{1}{4}\right)$

Estimate:

$\frac{3}{8} \approx \frac{\square}{\square}$ $\quad -\frac{1}{4} \approx$ _____

$\frac{\square}{\square}$ − _____

$= \frac{\square}{\square}$

Calculate:

$\frac{3}{8} - \left(-\frac{1}{4}\right)$

$= \frac{3}{8} - \left(-\frac{\square}{\square}\right)$ Find a common denominator.

$= \frac{3 + \square}{\square}$ Add the opposite.

$= \frac{\square}{\square}$

b) $1\frac{2}{5} + \left(-1\frac{3}{4}\right)$

Estimate:

Calculate:

Name: _____ Date: _____

3. Estimate and calculate.

a) $-\frac{3}{4} \times \left(-\frac{1}{9}\right)$

Estimate:

Calculate:

b) $3\frac{1}{3} \times 1\frac{3}{4}$

Estimate:

Calculate:

Change to improper fractions.

c) $\frac{1}{10} \div \left(-\frac{3}{8}\right)$

Estimate:

Calculate:

d) $-\frac{3}{8} \div 3\frac{1}{3}$

Estimate:

Calculate:

Change $3\frac{1}{3}$ to an improper fraction.

Name: _____ Date: _____

Apply

4. Virginia made 75 sandwiches for a party.
She made $\frac{1}{3}$ ham and cheese, $\frac{1}{3}$ roast beef, $\frac{1}{15}$ salmon, $\frac{1}{15}$ tuna, and the rest chicken salad.
How many sandwiches were chicken salad?

Ham and cheese: *Roast beef:* *Salmon:* *Tuna:*

$\frac{1}{3} \times 75$

$= \frac{1}{3} \times \frac{75}{1}$

$= \frac{\square}{\square}$

$=$ _____

Number of sandwiches that are not chicken salad = _____ + _____ + _____ + _____

= _____

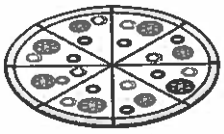
Number of chicken salad sandwiches = total sandwiches – non-chicken sandwiches

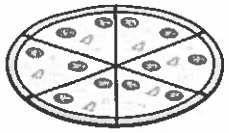
= _____ – _____

= _____

Sentence: _____

5. A vegetarian pizza is cut into 8 equal pieces. A Hawaiian pizza is cut into 6 equal pieces. Li ate 2 slices of the vegetarian pizza and 1 slice of the Hawaiian pizza.


Vegetarian pizza


Hawaiian pizza

a) How much pizza did Li eat?

Sentence: _____

b) How much pizza was left over?

Sentence: _____

Name: _____ Date: _____

7. Paul had $120 to spend on school supplies.
He spent $\frac{1}{2}$ on software, $\frac{1}{4}$ on paper, $\frac{1}{5}$ on pens and pencils, and the rest on other supplies.
How much did he spend on other supplies?

Sentence: _____

Math Link

Play this game with a partner or in a small group. You will need a deck of playing cards.

- Remove the jokers and face cards from the deck.
- Red cards represent positive integers.
  Black cards represent negative integers.
- Aces represent 1 or −1.
- Each player gets 4 cards. Use 2 of the 4 cards to make a fraction.
- The player whose fraction is furthest from 0 gets 1 point.
- The first player to get 10 points wins.