Math 60, Section 1.1, 1.3 Notes Name: Class Notes

Section 1.1: Arithmetic with Negative Numbers

Adding

1. Using the Context of Money

a. $\$6+\$7$ $= \$13$
earn earn

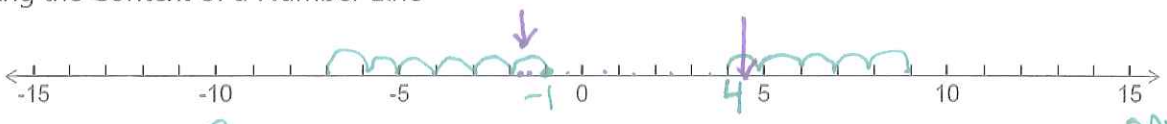
b. $-\$2.10+(-\$7.49)$ $= -\$9.59$
spend spend

c. $\$3+(-\$9)$ $= -\$6$
earn spend

d. $-\$10+\$12$ $= \$2$
spend earn

Rules
Same sign – add + keep the sign

2. Using the Context of a Number Line



a. $4+5$ $= 9$
right right

b. $-1+(-6)$ $= -7$
left left

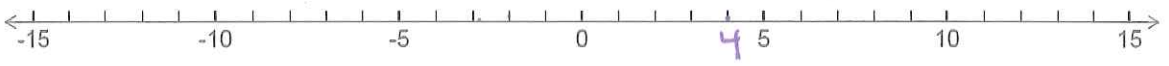
c. $4.5+(-6.25)=$ -1.75

d. $-7+12$ $= 5$

opposite signs – subtract + use sign of "larger"

Subtracting

3. Using the Context of a Number Line



a. $4-9$ $= -5$
right left

b. $-3-7$ $= -10$
left left
$-3+(-7)=-10$ $-3+-7=-10$

c. $4-(-6)$ $= 4+6=10$
left, right
$4-(-6)=10$

d. $-7.1-(-6.3)$
$= -.8$

4. Using the Context of Money

a. $\$10-\$13$ $= -\$3$

b. $-\$7-\$8$ $= -\$15$
spend spend

c. $\$11.75-(-\$7.25)$
$\$19$

d. $-\$4-(-\$9)$
$\$5$

5. Simplifying Longer Expressions

$15-7+5+14$

a. $15+(-7)+5-(-14)$

$= 15+5+14-7$
$= 20+14-7$
$= 34-7$
$= 27$

b. $4.5-5-(-11)-(-9)$
$= 4.5-5+11+9$
$= -.5+20$
$= 19.50$

Multiplying and Dividing

positive • positive = positive negative • negative = positive

positive • negative = negative negative • positive = negative

a. $-4 \cdot 3 = -12$ b. $-2(-9) = 18$ c. $-12 \div 3 = -4$

d. $-40 \div (-8) = 5$ e. $-2(3)(-4) = 24$ f. $(-1)(-2)(-3)(-4) = 24$ (+ + +)

g. $-10(-0.5) = 5$ h. $100(-0.4) = -40$ i. $-5.2(-6.1)$ if $52 \cdot 61 = 3172$, 31.72

j. $-4(0) = 0$ k. $0 \div 4$ 0, $\frac{0}{4} = 0$, $\frac{0}{K}$ l. $4 \div 0$, $\frac{4}{0}$ undefined, $\frac{K}{0}$

Exponents

a. $(-4)^2 = (-4)(-4) = 16$ b. $-4^2 = -4 \cdot 4 = -16$

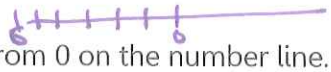
c. $(-2)^3 = (-2)(-2)(-2) = -8$ d. $-2^3 = -2 \cdot 2 \cdot 2 = -8$

e. $(-5)^4 = (-5)(-5)(-5)(-5) = 625$ f. $-5^4 = -5 \cdot 5 \cdot 5 \cdot 5 = -625$

g. $(-1)^{804} = 1$, $(-1)(-1)(-1)\cdots(-1)$, even # of negatives is positive h. $(-1)^{805} = -1$, odd # of negatives is negative

Section 1.3: Absolute Value and Square Roots

The absolute value of a number is its distance from 0 on the number line. Distance is always...



a. $|-6| = 6$ b. $-|-16| = -16$ c. $|-11-6| = |-17| = 17$ d. $-2|11-20| = -2|-9| = -2(9) = -18$

Square Root Facts

a. $\sqrt{81} = 9$ b. $-\sqrt{100} = -10$, -10

Finding Square Roots on the Calculator

a. $\sqrt{15} \approx 3.872$ b. $-\sqrt{67} \approx -8.185$

Square Roots of Fractions

a. $-\sqrt{\frac{144}{49}} = -\frac{12}{7}$ b. $\sqrt{\frac{1}{36}} = \frac{1}{6}$

Square Roots of Negative Numbers

a. $\sqrt{-36}$, $6 \cdot 6$, $(-6)(-6)$, not a real number b. $-\sqrt{\frac{81}{100}}$, not a real number