Math 45 Handout for 1.4 Adding, Subtracting, Multiplying, and Dividing Integers

Objectives:

1. Add subtract, multiply and divide integers (signed numbers).

Adding: $(+)+(+)=(+)$
$(-)+(-)=(-)$
$(+)+(-)$ } sign of # with larger absolute value
$(-)+(+)$ }

Subtracting: Rewrite as add the additive inverse of the number being subtracted. Then use rules for addition.

Ex. $-3-2 = -3+(-2) = \boxed{-5}$

Multiplying: $(+)(+) = (+)$
$(-)(-) = (+)$
$(+)(-) = (-)$
$(-)(+) = (-)$

Dividing: $\frac{(+)}{(+)}=(+)$ $\frac{(-)}{(-)}=(+)$ $\frac{(-)}{(+)}=(-)$ $\frac{(+)}{(-)}=(-)$

2. **Find the additive inverse of a number.**

"additive inverse" = "opposite"

3. **In Math 35, we used mixed numbers. In Math 45, do not used mixed numbers. Instead use improper fractions or decimals.**

Instead of $3\frac{3}{4}$, for your final answer write 3.75 or $\frac{15}{4}$.
Instead of $\times$ to mean multiply, use $\cdot$ or $(\,)(\,)$.

You should already know all of these problems from Math 35. If you are having trouble, get tutoring help right away from the Math Center (room 426), the ASC (room 420), or Ms. Carey's office hours.

Find the sum.

1) $46 + (-20) = 46-20 = \boxed{26}$

2) $22 + (-144) = -(144-22) = \boxed{-122}$

3) $-65 + (-140) = -(65+140) = \boxed{-205}$

4) $20 + (-20) = 20-20 = \boxed{0}$

5) $5 + (-2) + 18 + (-21) = 3+18-21$
$= 21-21$
$= \boxed{0}$

6) $-17 + (-10) + (-6) + (-24)$
$= -(17+10+6+24)$
$= \boxed{-57}$

Find the additive inverse (opposite) of the integer.

7) 4 $\boxed{-4}$

8) -9 $\boxed{9}$

Find the difference. (Add the additive inverse.)

9) $16 - 10 = 16+(-10) = \boxed{6}$

Find the difference.

10) $3 - 14 = 3+(-14) = \boxed{-11}$

11) $12 - (-5) = 12+5 = \boxed{17}$

12) $0 - (-10) = 0+10 = \boxed{10}$

13) $-8 - (-7) = -8+7 = \boxed{-1}$

14) $-17 - (-17) = -17+17 = \boxed{0}$

Note: There are often several ways to rewrite these; your goal is to do them no matter how they are written. But until you achieve that goal, you should write them in the way that makes the most sense to you.

Find the product.

15) $7(-2) = \boxed{-14}$

16) $(-2)(-3)(-6) = (6)(-6) = \boxed{-36}$

17) $3 \cdot -4 \cdot -4 = (-12)(-4) = \boxed{48}$

18) $(-2)(-2)(0)(8) = 4 \cdot 0 \cdot 8 = 0 \cdot 8 = \boxed{0}$

19) $(-5)(4)(-3)(-3) = (-20)(-3)(-3) = (60)(-3) = \boxed{-180}$

Evaluate the expression.

20) $|-49| + 30$

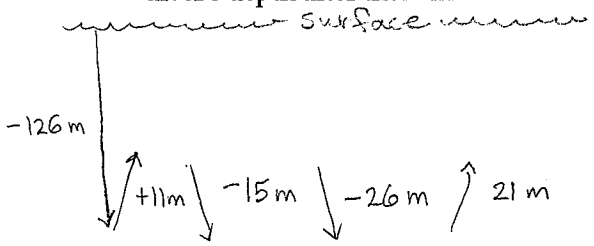
$= 49 + 30$

$= \boxed{79}$

absolute value | | makes the result non-negative

Solve the problem.

21) A deep-sea diver dives from the surface to 126 meters below the surface and then swims up 11 meters, down 15 meters, down another 26 meters, and then up 21 meters. Find the diver's depth after these movements.



$-126 + 11 - 15 - 26 + 21$

$= -(126 + 15 + 26) + (11 + 21)$

$= -167 + 32 = \boxed{-135 \text{ m}}$ or $\boxed{135 \text{ m deep}}$

22) Jared borrowed $264 from his friend Linda. He paid her back $41, but then had to borrow another $75. How much does he still owe her?

$-264 + 41 - 75$

$= -(264 + 75) + 41$

$= -339 + 41$

$= \boxed{\$298}$

always write the units on your answer $, meters, etc.

Find the multiplicative inverse (or reciprocal) of the number.

23) 15 $\boxed{\frac{1}{15}}$

24) 1 $\boxed{1}$

Divide.

25) $\frac{-28}{7} = -28 \div 7 = \boxed{-4}$

26) $\frac{21}{-3} = 21 \div (-3) = \boxed{-7}$

27) $\frac{-16}{-8} = -16 \div -8 = \boxed{2}$

28) $-16 \div 8 = \frac{-16}{8} = \boxed{-2}$

29) $30 \div (-5) = \frac{30}{-5} = \boxed{-6}$

30) $-104 \div (-4) = \frac{-104}{-4} = \boxed{+26}$