Section 3.3b – Practice Questions

- Inequalities represent an equation where one side is either **greater than, lesser than or equal** to the other side.
- The **rules and logic** of balance still work the same way.

EMERGING LEVEL QUESTIONS

1. $x + 3 > 7$

$-3 \quad -3$

$\boxed{x > 4}$

2. $t - 7 < -4$

$+7 \quad +7$

$\boxed{t < 3}$

3. $3x \leq 12$

$\overline{3} \quad \overline{3}$

$\boxed{x \leq 4}$

4. $-5q \geq 13$

$\overline{-5} \quad \overline{-5}$

$\boxed{q \leq -\frac{13}{5}}$

* Flip inequality divided by a negative *

5. $\frac{x}{4} \leq 12$ $\cdot 4 \quad \cdot 4$

$\boxed{x \leq 48}$

6. $3(d + 4) \geq 15$

$3d + 12 \geq 15$

$-12 \quad -12$

$3d \geq 3$

$\overline{3} \quad \overline{3}$

$\boxed{d \geq 1}$

PROFICIENT LEVEL QUESTIONS

7. $\frac{2}{3}t + \frac{1}{4} < \frac{2}{1}$ LCD: 12

$\frac{8t}{12} + \frac{3}{12} < \frac{24}{12}$

$8t + 3 < 24$
$-3 \quad -3$
$8t < 21$

$\boxed{t < \frac{21}{8}}$

8. $0.8z - 0.4z \geq -1$

$8z - 4z \geq -10$

$\frac{4z}{4} \geq \frac{-10}{4}$

$z \geq -10/4$ → $\boxed{z \geq -\frac{5}{2}}$

EXTENDING LEVEL QUESTIONS

9. $\frac{2}{3}\left(\frac{1}{4} - \frac{1}{6}t\right) \geq \frac{1}{3}$

$2\left(\frac{1}{4} - \frac{1}{6}t\right) \geq 1$

$\frac{2}{4} - \frac{2}{6}t \geq 1$

$\left(\frac{1}{2} - \frac{1}{3}t \geq 1\right) \times 6$

$3 - 2t \geq 6$
$-3 \quad -3$
$\frac{-2t}{-2} \geq \frac{3}{-2}$

$\boxed{t \leq -\frac{3}{2}}$

10. $\frac{1}{2}\left(\frac{2}{3} - \frac{4}{7}t\right) \geq \frac{1}{3}$

$\left(\frac{1}{3} - \frac{2}{7}t \geq \frac{1}{3}\right) \times 21$

$7 - 6t \geq 7$
$-7 \quad -7$

$\frac{-6t}{-6} \geq \frac{0}{-6}$ ← Flip

$\boxed{t \leq 0}$

Word Problems

Discover the equation in the following sentences. Then solve.

11. You open a book and the sum (addition) of the two pages is 111.
What are the two pages?

Two pages are consecutive

so

let a be pg 1 and b be the next page

$a + b = 111$

but $b = a + 1$

$a + a + 1 = 111$

$2a + 1 = 111$

$2a = 110$

$a = 55$

$\boxed{\text{pages 55 and 56}}$

12. In Victoria, a taxi charges $3.00 and then $0.60 for every kilometer you travel. How far can you go for $19.20?

Multiply by 100

Cost = 0.60 · km + 3.00

Cost = 0.60x + 3.00

19.20 = 0.60x + 3.00

1920 = 60x + 300
−300 −300

$\frac{1620}{60} = \frac{60x}{60}$

$\boxed{x = 27\text{ km}}$

13. The second angle of a triangle is four times as large as the first angle. The third angle is 30 degrees bigger than the first. What are the measurements of the three angles? (Angles in a triangle add to 180 degree)

angles: a, b, c

b = 4a c = a + 30

a + b + c = 180

a + 4a + a + 30 = 180

6a + 30 = 180

$\frac{6a}{6} = \frac{150}{6}$

a = 25

a = 25
b = 100
c = 55

14. If I have $2.05 and there are 3 dimes in the pile, how many quarters do I have?

dimes: 0.10d
quarters 0.25q

2.05 = 0.10d + 0.25q LCD: 100

205 = 10d + 25q

205 = 10(3) + 25q

205 = 30 + 25q

205 = 30 + 25q
−30 −30

$\frac{175}{25} = \frac{25q}{25}$

$\boxed{q = 7}$

15. If you double a number and add 36, you get five times the original number. What is the original number?

Let n be a number

double: 2n

2n + 36 = 5n
−2n −2n

$\frac{36}{3} = \frac{3n}{3}$

$\boxed{12 = n}$

16. Three consecutive numbers such that first number plus twice the second, plus five less than the third is 27. What are the three numbers?

Let numbers be a, b, c

$a = a$
$b = a+1$
$c = a+2$

$a, a+1, a+2$

$a + 2(a+1) + (a+2-5) = 27$

$a + 2a + 2 + a + (-3) = 27$

$4a - 1 = 27$
$+1 \quad +1$

$4a = 28$

$\frac{4a}{4} = \frac{28}{4}$

$\boxed{a = 7}$

$\boxed{7, 8, 9}$

Answer Key – Section 3.3b

1. $x > 4$	2. $t < 3$	3. $x \leq 4$	4. $q \leq -\frac{13}{5}$
5. $x \leq 48$	6. $d \geq 1$	7. $t < \frac{21}{8}$	8. $z \geq -\frac{5}{2}$
9. $t \leq -\frac{3}{2}$	10. $t \leq 0$	11. Pages: 55 and 56	12. km= 27
13. $25, 100, 55$	14. $q = 7$	15. $n = 12$	16. $7, 8, 9$