

Practice - Word Problems Involving Inequalities

Outcome PR-4 Single variable linear inequalities

- 1) The ninth grade class at Pi High is having a fundraiser. They need to raise at least \$1,500.
 They are selling magazines for \$7 each. How many subscriptions does that class need to sell to meet their fundraising goal?

Let $m = \#$ magazine subscriptions

Minimum amount!

↓
magazines

$$\begin{aligned} \text{Total subscriptions sold} &\geq \$1500 \\ \frac{\cancel{\$7} m}{\cancel{\$7}} &\geq \frac{\$1500}{\cancel{\$7}} \\ m &\geq 214.3 \end{aligned}$$

Class needs to sell 215 subscriptions.

You can't sell part of a magazine so we either round up OR down.

If you round down to 214 magazines, the class will not raise the required \$1500 (they'd be \$2 short).
 So, we would need to round up to 215 magazines.

- 2) Suzy wants to go on her class trip to New York City. If Suzy earns \$8 per hour babysitting, how many hours does she need to babysit in order to raise at least the \$500 needed for the trip?

Let $h = \#$ of hours babysitting

$$\begin{aligned} \text{Total babysitting money} &\geq \$500 \\ \frac{\cancel{\$8} h}{\cancel{\$8}} &\geq \frac{\$500}{\cancel{\$8}} \\ h &\geq 62.5 \end{aligned}$$

62 hours (short \$4)

63 hours ✓

Suzy would need to babysit at least 63 hours to earn at least \$500 for her trip.

- 3) Sam has \$2,450 in his bank account. He spends \$20 each week on gas money. After how many weeks will Sam's account balance fall below \$1,000?

Let $w = \#$ of weeks

$$\text{Starting balance} - \text{money spent on gas} \leq \$1000$$

$$\$2450 - \$20w \leq \$1000$$

$$-\$20w \leq \$1000 - \$2450$$

$$-\$20w \leq -\$1450$$

$$w \geq 72.6$$

~~72~~
(still above \$1000)

73

Don't forget this has to flip because you divide by a (-).

Sam's balance will fall below \$1000 after 73 weeks.

- 4) Sarah has at most \$30 to spend at the greenhouse on flowers for her summer garden. Impatiens cost \$2 each and coneflowers are \$3 each. If Sarah buys 8 impatiens, how many coneflowers can she afford?

Let $c = \#$ of coneflowers

$$\text{Amount spent on impatiens} + \text{Amount spent on coneflowers} \leq \$30$$

$$\$2 \cdot 8 + \$3 \cdot c \leq \$30$$

$$\$16 + \$3c \leq \$30$$

$$\$3c \leq \$30 - \$16$$

$$\frac{\$3c}{\$3} \leq \frac{\$14}{\$3}$$

$$c \leq 4.7$$

4
would spend more than \$30.

She can buy 4 coneflowers (max).

- 5) Jim and Joyce are saving for their annual vacation. They are going to Hawaii and their plane tickets cost \$2418 total. They have saved \$1804 so far. If they are able to save \$55 per week, how many weeks of saving will it take before they have saved at least \$2418?

Let $w = \#$ of weeks

$$\text{Already saved} + \text{Weekly savings} \geq \$2418$$

$$\$1804 + \$55w \geq \$2418$$

$$\$55w \geq \$2418 - \$1804$$

$$\frac{\$55w}{\$55} \geq \frac{\$614}{\$55}$$

$$w \geq 11.2$$

~~11~~ OR 12

Not enough.

They would need to save for a minimum of 12 weeks.