

BOX 2

Equations Quiz Review

$$1) \quad -\frac{4}{13}y - 7 = 6$$

$$\quad \quad \quad +7 \quad +7$$

$$-\frac{13}{4} \left(-\frac{4}{13}y \right) = (13) \frac{-13}{4}$$

$$y = -169/4$$

$$\text{OR } y = -42 \frac{1}{4}$$

$$2) \quad \frac{p+3}{10} = (4)10$$

$$p+3 = 40$$

$$p = 37$$

$$3) \quad \frac{h-7}{6} = (1)6$$

$$h-7 = 6$$

$$h = 13$$

$$4) \quad \frac{5f+1}{8} = (-3)8$$

$$5f+1 = -24$$

$$5f = -25$$

$$f = -5$$

$$5) \quad \frac{4n-8}{-2} = (12)^{-2}$$

$$4n-8 = -24$$

$$4n = -16$$

$$n = -4$$

$$6) \quad \frac{-3t-4}{2} = (8)2$$

$$-3t-4 = 16$$

$$-3t = 20$$

$$t = -20/3 \text{ OR } 6 \frac{2}{3}$$

$$7) \quad 4.8a - 3 + 1.2a = 9$$

$$6a - 3 = 9$$

$$6a = 12$$

$$a = 2$$

$$8) \quad 5x+1 = 3x-3$$

$$2x+1 = -3$$

$$2x = -4$$

$$x = -2$$

$$9) \begin{array}{r} -3z + 5 = 2z + 5 \\ +3z \quad \quad +3z \end{array}$$

$$5 = 5z + 5$$

$$0 = 5z$$

$$\frac{0}{5} = \frac{5z}{5}$$

$$\boxed{0 = z}$$

$$13) \begin{array}{r} 1.9s + 6 = 3.1 - s \\ 2.9s + 6 = 3.1 \end{array}$$

$$2.9s + 6 = 3.1$$

$$2.9s = -2.9$$

$$\boxed{s = -1}$$

$$10) \begin{array}{r} \frac{1}{2}a - 4 = 3 - \frac{1}{4}a \\ +4 \quad +4 \end{array}$$

$$\frac{1}{2}a = 7 - \frac{1}{4}a$$

$$+\frac{1}{4}a \quad \quad +\frac{1}{4}a$$

$$\frac{3}{4}(\frac{2}{3}a) = (7)\frac{3}{4}$$

$$\boxed{a = \frac{28}{3} \text{ or } 9\frac{1}{3}}$$

$$14) \begin{array}{r} 2.9m + 1.7 = 3.5 + 2.3m \\ 0.6m + 1.7 = 3.5 \end{array}$$

$$0.6m + 1.7 = 3.5$$

$$0.6m = 1.8$$

$$\boxed{m = 3}$$

$$15) \left(\frac{1}{2}x - \frac{1}{3} = \frac{1}{3} - \frac{1}{2}\right) 6$$

$$3x - 2 = 2x - 3$$

$$x - 2 = -3$$

$$\boxed{x = -1}$$

$$11) \begin{array}{r} -28 + p = 7(p - 10) \\ -28 + p = 7p - 70 \end{array}$$

$$-28 + p = 7p - 70$$

$$-28 = 6p - 70$$

$$42 = 6p$$

$$\boxed{7 = p}$$

$$16) \left(\frac{3t+1}{4}\right) 4 = \left(\frac{3t-5}{4}\right) 4$$

$$3t + 1 = 3t - 20$$

$$1 = -20$$

$$\boxed{\text{NO solution}}$$

$$12) \begin{array}{r} -4x + 6 = 0.5(x + 30) \\ -4x + 6 = .5x + 15 \end{array}$$

$$-4x + 6 = .5x + 15$$

$$-4x = .5x + 9$$

$$-4.5x = 9$$

$$\boxed{x = -2}$$

$$17) \left(3y - \frac{4}{5} = \frac{1}{3}y\right) 15$$

$$45y - 12 = 5y$$

$$-12 = -40y$$

$$\boxed{\frac{3}{10} = y}$$

$$\begin{array}{r}
 18. \quad -0.2(1-x) = 2(4+0.1x) \\
 -0.2 \quad +0.2x = 8 + 0.2x \\
 \quad \quad -0.2x \quad \quad -0.2x \\
 \hline
 -0.2 = 8 \\
 \text{NO SOLUTION}
 \end{array}$$

$$\begin{array}{r}
 19. \quad X = \text{the \#} \\
 20 - 2x = 3x - 10 \\
 +10 \quad +2x \quad +2x \quad +10 \\
 \hline
 30 = 5x \\
 6 = x \\
 \text{The number is 6.}
 \end{array}$$

$$\begin{array}{r}
 20. \quad X = \text{the \#} \\
 4x = 2x - 14 \\
 -2x \quad -2x \\
 \hline
 2x = -14 \\
 2 \quad 2 \\
 \hline
 x = -7 \\
 \text{The number is -7.}
 \end{array}$$

$$\begin{array}{r}
 21. \quad l = \text{length} \quad w = \text{width} \\
 9+2w \\
 w \quad \boxed{P=174} \quad w \\
 9+2w
 \end{array}$$

$$\begin{array}{r}
 l = 9 + 2w \\
 l = 9 + 2(20) \\
 l = 49 \\
 \text{length is 49m} \\
 \text{and width is 20m.}
 \end{array}$$

$$\begin{array}{r}
 22. \quad n = \text{hours} \\
 650 = 45n + 443 \\
 -443 \quad \quad -443 \\
 \hline
 207 = 45n \\
 45 \quad 45 \\
 \hline
 4.6 = n
 \end{array}$$

He worked for 4.6 hrs.

$$\begin{array}{r}
 26. \quad n = \text{hours} \\
 520 + 21n = 604 \\
 -520 \quad \quad -520 \\
 \hline
 21n = 84 \\
 21 \quad 21 \\
 \hline
 n = 4
 \end{array}$$

He worked 4 hrs. overtime.

$$\begin{array}{r}
 27. \quad x = \text{price/shirt} \\
 6x - 25 = 86 \\
 +25 \quad +25 \\
 \hline
 6x = 111 \\
 6 \quad 6 \\
 \hline
 x = 18.5
 \end{array}$$

Each shirt was \$18.50

World's Most Expensive College... Box 3

1) $5x + 2(x+4) = 64$

$$5x + 2x + 8 = 64$$

$$7x + 8 = 64$$

$$\frac{7x}{7} = \frac{56}{7}$$

$$\boxed{x = 8}$$

2) $9(y-2) + 4 = 31$

$$9y - 18 + 4 = 31$$

$$9y - 14 = 31$$

$$\frac{9y}{9} = \frac{45}{9}$$

$$\boxed{y = 5}$$

3) $7 + 4(2a + 15) = -13$

$$7 + 8a + 60 = -13$$

$$8a + 67 = -13$$

$$\frac{8a}{8} = \frac{-80}{8}$$

$$\boxed{a = -10}$$

4) $4(n-5) - 11n = 0$

$$4n - 20 - 11n = 0$$

$$-5n - 20 = 0$$

$$\frac{-5n}{-5} = \frac{20}{-5}$$

$$\boxed{n = -4}$$

5) $20 = 8 + 3(12 + 4x)$

$$20 = 8 + 36 + 12x$$

$$20 = 44 + 12x$$

$$\frac{-24}{12} = \frac{12x}{12}$$

$$\boxed{-2 = x}$$

6) $-2(w-7) + 10w = 34$

$$-2w + 14 + 10w = 34$$

$$8w + 14 = 34$$

$$8w = 20$$

$$\boxed{w = \frac{5}{2} \text{ or } 2.5}$$

7) $9y - 4(y+5) = 40$

$$9y - 4y - 20 = 40$$

$$5y - 20 = 40$$

$$\frac{5y}{5} = \frac{60}{5} \quad \boxed{y = 12}$$

8) $10 - 3(m-2) = 8$

$$10 - 3m + 6 = 8$$

$$16 - 3m = 8$$

$$\frac{-3m}{-3} = \frac{-8}{-3}$$

$$\boxed{m = \frac{8}{3} \text{ or } 2\frac{2}{3}}$$

$$9) 14d - (4 - 5d) = -67$$

$$14d - 4 + 5d = -67$$

$$21d - 4 = -67$$

$$\frac{21d}{21} = \frac{-63}{21}$$

$$\boxed{d = -3}$$

$$10) 7(4x - 1) + x = 36$$

$$42x - 7 + x = 36$$

$$43x - 7 = 36$$

$$\frac{43x}{43} = \frac{43}{43}$$

$$\boxed{x = 1}$$

$$11) 11 - 2(8 + 3p) = 72$$

$$11 - 16 - 6p = 49$$

$$-5 - 6p = 49$$

$$\frac{-6p}{-6} = \frac{54}{-6}$$

$$\boxed{p = -9}$$

$$13) \left(\frac{2}{7}(4m - 18) = 12 \right) \frac{7}{2}$$

$$4m - 18 = 42$$

$$\frac{4m}{4} = \frac{60}{4}$$

$$\boxed{m = 15}$$

$$12) \left(\frac{1}{4}(5b + 11) = 19 \right) 4$$

$$5b + 11 = 76$$

$$5b = 65$$

$$\boxed{b = 13}$$

$$14) 75 = 3(-10t - 3) + 6t$$

$$75 = -30t - 9 + 6t$$

$$75 = -24t - 9$$

$$\frac{84}{-24} = \frac{-24t}{-24}$$

$$\boxed{-\frac{7}{2} \text{ or } -3.5 = t}$$

$$15) \left(\frac{5}{6}(9 + 2x) = 40 \right) \frac{6}{5}$$

$$9 + 2x = -48$$

$$\frac{2x}{2} = \frac{-57}{2}$$

$$\boxed{x = -28.5}$$

$$16) A = 110$$

$$133 = 7(3x - 2)$$

$$133 = 21x - 14$$

$$\frac{147}{21} = \frac{21x}{21}$$

$$\boxed{7 = x}$$

$$17) x = 4 \text{ passenger}$$

$$y = 6 \text{ passenger } y = x - 3$$

$$4x + 6y = 92$$

$$4x + 6(x - 3) = 92$$

$$4x + 6x - 18 = 92$$

$$10x = 110$$

$$\boxed{x = 11}$$

What do you call an arrow. --

Word
Prob.

① $X = \text{Jack's number}$

$$5X + 8 = 93$$

$$\begin{array}{r} -8 \quad -8 \\ 5X = 85 \\ \hline 5 \quad 5 \end{array}$$

$$X = 17$$

Jack's # is 17.

② $X = \text{Jill's number}$

$$\frac{1}{4}X - 20 = -45$$

$$\begin{array}{r} +20 \quad +20 \\ 4 \left(\frac{1}{4}X \right) = (-25) \cdot 4 \end{array}$$

$$X = -100$$

Jill's # is -100

③ $J = \text{Jimmy's age}$

$$50 = 3J + 2$$

$$\begin{array}{r} -2 \quad -2 \\ 48 = 3J \\ \hline 3 \quad 3 \end{array}$$

$$16 = J$$

Jimmy is 16 yrs. old.

④ $F = \text{Father's weight}$

$$99 = \frac{2}{3}F - 5$$

$$\begin{array}{r} +5 \quad +5 \\ \frac{3}{2}(99) = \left(\frac{2}{3}F\right) \cdot \frac{3}{2} \end{array}$$

156 lbs

⑤ $X = \text{posters printed}$

$$1000 = 180 + 2.5X$$

$$\begin{array}{r} -180 \quad -180 \\ 820 = 2.5X \\ \hline 2.5 \quad 2.5 \end{array}$$

$$328 = X$$

328 posters

⑥ $h = \text{earn per hour}$

$$38h - 88 = 273$$

$$\begin{array}{r} +88 \quad +88 \\ 38h = 361 \end{array}$$

$$\frac{361}{38} = h$$

$$h = 9.5$$

\$9.50 per hour

⑦ $X = \text{students}$

$$415X + 7 = 495$$

$$\begin{array}{r} -7 \quad -7 \\ 415X = 488 \\ \hline 415 \quad 415 \end{array}$$

$$X = 610$$

610 students

⑧ $r = \text{roses ordered}$

$$2.95r + 8.50 = 61.60$$

$$\begin{array}{r} -8.50 \quad -8.50 \\ 2.95r = 53.1 \end{array}$$

$$\frac{53.1}{2.95} = r$$

$$r = 18$$

18 roses

⑨ $h = \text{hours}$

$$8 - 3.5h = -20$$

$$\begin{array}{r} -3.5h = -28 \\ \underline{-3.5} \quad \underline{-3.5} \end{array}$$

$$-h = 8$$

8 hours

⑩ $C = \text{cartridge}$

$$2(675) + 80C = 2310$$

$$\begin{array}{r} 1350 + 80C = 2310 \\ \underline{-1350} \quad \underline{-1350} \end{array}$$

$$\begin{array}{r} 80C = 960 \\ \underline{80} \quad \underline{80} \end{array}$$

$$C = 12$$

12 cartridges

Why didn't the Astronauts...

① $4(x-9) = 7x + 4$
 $4x - 36 = 7x + 4$
 $-4x \quad -4x$

$$\begin{array}{r} -36 = 3x + 4 \\ -4 \quad -4 \\ \hline -40 = 3x \\ \frac{-40}{3} = \frac{3x}{3} \end{array}$$

$-13\frac{1}{3} = x$

② Perim. Square = Perim. Δ

a.) $4(x-5) = x+x+12$

$$4x - 20 = 2x + 12$$

$$\begin{array}{r} -2x \quad -2x \\ 2x - 20 = 12 \\ +20 \quad +20 \\ \hline 2x = 32 \\ \frac{2x}{2} = \frac{32}{2} \end{array}$$

$x = 16$

b.) $4(16-5) = P$

$$4(11) = P$$

44 units

③ a.) $h = \text{hours rented}$

$$180 + 92h = 250 + 78h$$

$$\begin{array}{r} +180 \quad -180 \\ 92h = 70 + 78h \\ -78h \quad -78h \end{array}$$

$$\frac{14h}{14} = \frac{70}{14}$$

$h = 5 \text{ hours}$

b.) $180 + 92(5) = \text{cost}$

$\$640$

④ a.) $x = \text{min.}$

$$250 + 110x = 2200 - 150x$$

$$\begin{array}{r} +150x \quad +150x \\ 250 + 260x = 2200 \\ -250 \quad -250 \end{array}$$

$$\frac{260x}{260} = \frac{1950}{260}$$

$x = 7.5 \text{ min.}$

b.) $250 + 110(7.5)$

1075 ft.

⑤ a.) $h = \text{hours}$
 $27 + 2.5h = 14$
 $+4h \quad +4h$

$$-7 + 6.5h = 19$$

$$\begin{array}{r} +7 \quad +7 \\ 6.5h = 26 \\ \frac{6.5h}{6.5} = \frac{26}{6.5} \end{array}$$

$h = 4 \text{ hours}$

b.) $-7 + 2.5(4)$

$$-7 + 10$$

3 degrees

⑥ $x = \# \text{ shirts}$

$$a.) 12x = 5000 + 400 + 3x$$

$$\begin{array}{r} -3x \quad -3x \\ 9x = 5400 \\ \frac{9x}{9} = \frac{5400}{9} \end{array}$$

$x = 600 \text{ shirts}$

b.) $12(600)$

$\$7200$

⑦ $X = \text{seconds}$

$$a.) 16X + 14X = 270$$

$$\frac{30X = 270}{30 \quad 30}$$

$$X = 9 \text{ seconds}$$

$$b.) 16(9)$$

$$144 \text{ ft}$$

Consecutive Integer Problems

1. $x = 1^{\text{st}}$ $x + x + 1 + x + 2 + x + 3 = -42$
 $x + 1 = 2^{\text{nd}}$ $4x + 6 = -42$
 $x + 2 = 3^{\text{rd}}$ $\frac{4x}{4} = \frac{-48}{4}$
 $x + 3 = 4^{\text{th}}$ $x = -12$

The integers are
 $-12, -11, -10, \text{ and } -9.$

2. $x = 1^{\text{st}}$ $x + x + 2 + x + 4 + x + 6 = -100$
 $x + 2 = 2^{\text{nd}}$ $4x + 12 = -100$
 $x + 4 = 3^{\text{rd}}$ $\frac{4x}{4} = \frac{-112}{4}$
 $x + 6 = 4^{\text{th}}$ $x = -28$

The integers are
 $-28, -26, -24, \text{ and } -22.$

3. $x = 1^{\text{st}}$ $x + x + 2 + x + 4 = 105$
 $x + 2 = 2^{\text{nd}}$ $3x + 6 = 105$
 $x + 4 = 3^{\text{rd}}$ $\frac{3x}{3} = \frac{99}{3}$
 $x = 33$

The integers are
 $33, 35, \text{ and } 37.$

4. $x = 1^{\text{st}}$ $x + x + 2 + x + 4 = x + 40$
 $x + 2 = 2^{\text{nd}}$ $3x + 6 = x + 40$
 $x + 4 = 3^{\text{rd}}$ $-x \quad -x$
 $2x + 6 = 40$

The integers are
 $17, 19, \text{ and } 21.$

$\frac{2x}{2} = \frac{34}{2}$
 $x = 17$

$$\begin{array}{r}
 5. \quad x = 1st \\
 x + 2 = 2nd \\
 x + 2 = 2x - 10 \\
 -x \qquad -x \\
 \hline
 2 = x - 10 \\
 +10 \quad +10 \\
 \hline
 8 = x
 \end{array}$$

The integers are 8 and 10.

$$\begin{array}{r}
 6. \quad x = 1st \\
 x + 2 = 2nd \\
 x + 4 = 3rd \\
 x = \frac{1}{2}(x + 4) + 2 \\
 x = \frac{1}{2}x + 2 + 2 \\
 -\frac{1}{2}x \quad -\frac{1}{2}x \\
 \hline
 2(\frac{1}{2}x) = (4)2 \\
 x = 8
 \end{array}$$

The integers are 8, 10, and 12.

$$\begin{array}{r}
 7. \quad x = \text{shortest side} \\
 x + 2 = \text{medium side} \\
 x + 4 = \text{longest side} \\
 x + x + 2 + x + 4 = P \\
 3x + 6 = 10
 \end{array}$$

$$\begin{array}{r}
 x + 4 = 3x + 6 - 22 \\
 x + 4 = 3x - 16 \\
 20 = 2x \\
 10 = x
 \end{array}$$

The longest side is 14 cm.

$$\begin{array}{r}
 8. \quad \text{Circular} - C = 49.99 + .40m \\
 \text{Ventron} - C = 54.99 + .35m \\
 m = \text{minutes} \\
 C = \text{cost}
 \end{array}$$

$$\begin{array}{r}
 49.99 + .40m = 54.99 + .35m \\
 - .35m \qquad - .35m \\
 \hline
 49.99 + .05m = 54.99
 \end{array}$$

$$\begin{array}{r}
 49.99 + .05m = 54.99 \\
 -49.99 \qquad -49.99 \\
 \hline
 .05m = 5
 \end{array}$$

$$\begin{array}{r}
 .05m = 5 \\
 \underline{\quad .05} \quad \underline{\quad .05} \\
 m = 100
 \end{array}$$

It will take 100 minutes for costs to be equal.

9. $S = \text{songs}$ $C = \text{cost}$

iTunes - $.99S = C$

Napster - $C = .89S + 10$

$.99S = .89S + 10$

$-.89S = -.89S$

$.1S = 10$

$S = 100$

It will take 100 songs.

10. Adv. Plex $C = 300 + 12K$

$C = \text{cost}$

Bright Child $C = 180 + 15K$

$K = \text{kid}$

Chuck E. Cheese $C = 18K$

a. $300 + 12K = 180 + 15K$

$-180 \quad -12K \quad -180 \quad -12K$

$120 = 3K$

$40 = K$

The breakeven point is 40 kids.

b. $300 + 12K = 18K$

$-12K \quad -12K$

$300 = 6K$

$50 = K$

The breakeven point is 50 kids.

c. $180 + 15K = 18K$

$-15K \quad -15K$

$180 = 3K$

$60 = K$

The breakeven point is 60 kids.

11. Homer - $T = 400 - 5W$

$T = \text{Total weight}$

Barney - $T = 322 - 3W$

$W = \text{week}$

It will take 39 weeks.

$400 - 5W = 322 - 3W$
 $-322 + 5W = -322 + 5W$
 $78 = 2W$
 $39 = W$

$W = 39$

12. Comic Book Guy $T = 435 - 5w$
 Prof. Frink $T = 123 + 3w$

$T = \text{total weight}$
 $w = \text{week}$

$$\begin{array}{r} 435 - 5w = 123 + 3w \\ -123 + 5w \quad -123 + 5w \\ \hline 312 = 8w \\ 8 \quad 8 \\ \hline 39 = w \end{array}$$

It will take
39 weeks.

13. $s = \text{sweet n sour}$
 $b = \text{barbecue}$

$$\begin{array}{r} b = s - 5 \\ 10b = 9s \\ \hline 10(s - 5) = 9s \\ 10s - 50 = 9s \\ -50 = -s \\ -1 \quad -1 \\ \hline 50 = s \end{array}$$

BBQ sauce has
45 calories &
sweet & sour sauce
has 50 calories.

14. 1st tank - $550 + 75m$
 2nd tank - $1100 - 75m$

$m = \text{minutes}$
 $T = \text{Total water}$

$$\begin{array}{r} 550 + 75m = 1100 - 75m \\ -550 \quad -550 \\ \hline 75m = 1050 - 75m \\ +75m \quad +75m \\ \hline 150m = 1050 \\ 150 \quad 150 \\ \hline m = 7 \end{array}$$

It will take 7 minutes to have the same
amount of water.

15. $m = \# \text{min. after 1st 20 min.}$

$$\begin{array}{r} (10-10-20) \\ \cdot 99 + .05m > .06(20) + .06m \\ \text{(AT: T)} \end{array}$$

$$\begin{array}{r} \cdot 99 + .05m > 1.2 + .06m \\ - .99 \quad - .06m \quad - .99 \quad - .06m \end{array}$$

$$\begin{array}{r} .1m > .21 \\ .01 \quad - .01 \end{array}$$

$$m > 21$$

AT: T will be cheaper at 41 and up.

$$21 + 20 = 41$$

16. $h = \# \text{hrs after 1st hr.}$

$$\begin{array}{r} (S.S.M) \quad (A.M) \\ 100 + 50h < 40 + 60h \\ - 40 \quad - 50h \quad - 40 \quad - 50h \end{array}$$

$$\begin{array}{r} 40 < 10h \\ 10 \quad 10 \\ 4 < h \end{array}$$

Starting Students Movers is cheaper after 4 hours.