

# Math 1111 Sample Test Solution Test 1

$$1) 2(4+2x) = 3(x-5)$$

$$8 + 4x = 3x - 15$$

$$4x - 3x = -15 - 8$$

$$x = -23$$

$$2) \frac{3(x+4)}{x+4} = \frac{3(x+4)}{3}$$

$$LCM = 3(x+4)$$

$$3x = 4(x+4)$$

$$3x = 4x + 16$$

$$3x - 4x = 16$$

$$-x = 16$$

$$x = -16$$

3) let  $x$  = her hourly rate

	hourly rate	hours worked	Salary
regular	$x$	40	$40x$
Overtime	$1.5x$	12	$1.5x(12)$
		52	841

$$40x + 18x = 841$$

$$\frac{58x}{58} = \frac{841}{58}$$

$$x = \$14.50 \text{ hourly rate}$$

$$4) x^2 - 6x = 0$$

$$x(x-6) = 0$$

$$x = 0 \quad x - 6 = 0$$

$$x = 6$$

$$5) z^2 + 2z - 15 = 0$$

$$(z+5)(z-3) = 0$$

$$z+5=0 \quad z-3=0$$

$$z = -5$$

$$z = 3$$

$$6) (x-7)^2 = 49 \quad \text{SRM}$$

$$x-7 = \pm 7$$

$$x = 7 \pm 7$$

$$x = 14 \quad x = 0$$

$$7) x^2 - 18x$$

$$\left(\frac{18}{2}\right)^2 = (9)^2 = 81$$

$$8) x^2 + 6x = 7 \quad \left(\frac{6}{2}\right)^2 = 3^2 = 9$$

$$x^2 + 6x + 9 = 7 + 9$$

$$(x+3)(x+3) = 16$$

$$(x+3)^2 = 16$$

$$x+3 = \pm 4$$

$$x = -3 \pm 4$$

$$x = -7$$

$$x = 1$$

$$10) 3x^2 - 7x + 2 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = 3$$

$$b = -7$$

$$c = 2$$

$$= \frac{-(-7) \pm \sqrt{(-7)^2 - 4(3)(2)}}{2(3)}$$

$$= \frac{7 \pm \sqrt{49 - 24}}{6} = \frac{7 \pm \sqrt{25}}{6} = \frac{7 \pm 5}{6} = \frac{12}{6} = 2$$

$$= \frac{2}{6} = \frac{1}{3}$$

$$9) x^2 - 2x - 10 = 0 \quad a = 1$$

$$b = -2$$

$$c = -10$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-10)}}{2(1)}$$

$$= \frac{2 \pm \sqrt{4 + 40}}{2}$$

$$= \frac{2 \pm \sqrt{44}}{2} = \frac{2 \pm \sqrt{4}\sqrt{11}}{2}$$

$$= \frac{2 \pm 2\sqrt{11}}{2} = \frac{2}{2} \pm \frac{2\sqrt{11}}{2}$$

$$= 1 \pm \sqrt{11}$$

$$\begin{aligned}
 11) \quad & (8-8i) + (5+5i) \\
 & = 8+5 + -8i+5i \\
 & = \boxed{13-3i}
 \end{aligned}$$

$$\begin{aligned}
 12) \quad & (-6+5i) - (8-9i) \\
 & = -6+5i-8+9i \\
 & = \boxed{-14+14i}
 \end{aligned}$$

$$\begin{aligned}
 13) \quad & (2-9i)(8+i) \text{ FOIL} \\
 & = 16+2i-72i-9i^2 \\
 & = 16-70i+9 \\
 & = \boxed{25-70i}
 \end{aligned}$$

$$\begin{aligned}
 14) \quad & \frac{8-i}{8+i} \cdot \frac{8-i}{8-i} \\
 & = \frac{64-8i-8i+i^2}{64-8i+8i-i^2} = \frac{64-16i-1}{64+1} \\
 & = \frac{63-16i}{65} = \frac{63}{65} - \frac{16i}{65} = \boxed{\frac{63}{65} - \frac{16i}{65}}
 \end{aligned}$$

$$15) \quad x^2 + 1 = 0$$

$$x^2 = -1$$

$$x = \pm\sqrt{-1}$$

$$x = \pm i$$

16)  $\boxed{[-3, 2)}$  interval notation (B)

$\boxed{-3 \leq x < 2}$  inequality (A)

$$17) \quad \boxed{[3, 7]}$$



$$18) \quad 7-6(1-x) \leq 9$$

$$7-6+6x \leq 9$$

$$1+6x \leq 9$$

$$\frac{6x}{6} \leq \frac{8}{6}$$

$$x \leq \frac{4}{3}$$

$$\boxed{(-\infty, \frac{4}{3}]}$$

$$19) -3 < \frac{2x-4}{5} < 0$$

$$(5) -3 < \frac{2x-4}{5} < 0 \quad (5)$$

$$\begin{array}{ccc} -15 < 2x-4 < 0 \\ +4 & +4 & +4 \end{array}$$

$$-\frac{11}{2} < \frac{2x}{2} < \frac{4}{2}$$

$$-\frac{11}{2} < x < 2$$

$$\left(-\frac{11}{2}, 2\right)$$

$$22) |3-4x| > 9$$

$$3-4x > 9 \quad | \quad 3-4x < -9$$

$$\frac{-4x}{-4} > \frac{6}{-4} \quad | \quad \frac{-4x}{-4} < \frac{-12}{-4}$$

$$x < -\frac{3}{2} \quad | \quad x > 3$$

$$\left(-\infty, -\frac{3}{2}\right) \cup (3, \infty)$$

$$20) |6x+8| = 4$$

$$|x| = a$$

$$x = a \text{ or } x = -a$$

$$6x+8=4 \quad | \quad 6x+8=-4$$

$$6x = -4$$

$$x = -\frac{4}{6}$$

$$x = -\frac{2}{3}$$

$$6x = -12$$

$$x = -2$$

$$21) |x-2| + 8 < 9$$

$$-8 \quad -8$$

$$|x-2| < 1$$

$$\begin{array}{ccc} -1 < x-2 < 1 \\ +2 & +2 & +2 \end{array}$$

$$1 < x < 3$$

$$(1, 3)$$

23) let  $x$  = number of televisions

$$140x \text{ total revenue}$$

24) let  $x$  = amount (pounds) of Earl Grey Tea

$$(\%) (\text{amt}) + (\%) (\text{amt}) = (\%) (\text{amt}) \text{ (final mixture)}$$

$$(6)(x) + (4)(300-x) = (5.50)(300)$$

$$6x + 1200 - 4x = 1650$$

$$2x + 1200 = 1650$$

$$2x = 450$$

$$x = \boxed{225 \text{ lbs}} \text{ of Earl Grey Tea}$$

$$300 - x = 300 - 225 = \boxed{75 \text{ lbs}} \text{ of Orange Pekoe Tea}$$

25) Trent's work rate  $\frac{1}{40}$

Lois work rate  $\frac{1}{60}$

working together (rate)  $\frac{1}{x}$

let  $x$  = time working together to do the job

$$120x \left( \frac{1}{40} + \frac{1}{60} \right) = \frac{120x}{x} \quad \text{let } = 120x$$

$$3x + 2x = 120$$

$$\frac{5x}{5} = \frac{120}{5}$$

$$\boxed{x = 24 \text{ minutes (together)}}$$