

Show all reasonable work clearly, neatly, systematically, and understandably. Any understatement and/or incorrect statement may be penalized.

1. (2 pts) Translate: "Three less than the difference between four and a number"

$$\frac{(4-x) - 3}{\quad}$$

2. (2 pts) Translate: " Four times a number, added to seven"

$$\frac{\frac{3}{x} + 7}{\quad}$$

3. (2 pts) Translate: "Seven more than the quotient of three and a number"

$$\frac{5(x-3)}{\quad}$$

4. (2 pts) Translate: " The product of five and the difference between a number and three"

$$\frac{5 + (3x + 2)}{\quad}$$

5. (2 pts) Translate: " Five increased by the sum of three times a number and two"

$$\frac{6 - 3(x-3)}{\quad}$$

6. (2 pts) Translate: " Six decreased by three times the difference between a number and three"

7. (5 pts) Simplify:  $-7 - 3[2 - 4(3x - 2) - 4x] + 2x$

$$= -7 - 3 \cdot [2 - 12x + 8 - 4x] + 2x$$

$$= -7 - 3 \cdot [-16x + 10] + 2x$$

$$= -7 + 48x - 30 + 2x$$

$$= -37 + 50x //$$

Side Work

8. (5 pts) Evaluate:  $\frac{n}{3}[3a + d(n-1)]$ , for  $n=9, a=-1.2, d=1.5$

$$= \frac{9}{3} \cdot [3(-1.2) + 1.5 \cdot (9-1)]$$

$$= 3 \cdot [-3.6 + 1.5(8)]$$

$$= 3 \cdot [-3.6 + 12]$$

$$= 3 \cdot (8.4)$$

$$= 25.2 //$$

$$\begin{array}{r} 1 \quad 10 \\ 12.0 \\ - 3.6 \\ \hline 8.4 \end{array}$$

9. (5 pts) Evaluate:  $b^2 - 4ac$ , for  $a = \frac{5}{6}, b = -\frac{3}{4}, c = -\frac{8}{15}$

$$\begin{aligned}
 &= \left(-\frac{3}{4}\right)^2 - 4\left(\frac{5}{6}\right)\left(-\frac{8}{15}\right) \\
 &= \frac{9}{16} - \left(-\frac{16}{9}\right) \\
 &= \frac{9}{16} + \frac{16}{9} \\
 &= \frac{81}{144} + \frac{256}{144}
 \end{aligned}$$

$= \frac{337}{144} //$

Side Work

$$\frac{4}{1} \cdot \frac{3}{6} \cdot \left(-\frac{8}{15}\right)$$

$$\begin{array}{r}
 \frac{5}{16} \\
 \times 9 \\
 \hline
 144
 \end{array}$$

10. (5 pts) Solve:  $-4[x + 3(x - 5)] = 3(8x + 20)$ .

$$\begin{aligned}
 -4[x + 3x - 15] &= 24x + 60 \\
 -4[4x - 15] &= 24x + 60 \\
 -16x + 60 &= 24x + 60 \\
 60 &= 40x + 60 \\
 0 &= 40x \\
 0 &= x \\
 \{0\} //
 \end{aligned}$$

11. (5 pts) Solve:  $-0.2(0.3x - 7) - 0.3(1.2x + 0.7) = x$ .

$$\begin{aligned}
 -0.06x + 1.4 - 0.36x - 0.21 &= x \\
 -0.42x + 1.19 &= x \\
 1.19 &= 1.42x \\
 \frac{1.19}{1.42} &= x \\
 \frac{119}{142} &= x
 \end{aligned}$$

$$\left\{ \frac{119}{142} \right\}$$

$$\begin{array}{r}
 3 \quad 10 \\
 1.42 \\
 - 0.21 \\
 \hline
 1.19
 \end{array}$$

12. (5 pts) Solve:  $\frac{5}{6}\left(\frac{4}{5}n - \frac{3}{2}\right) = -\frac{1}{3}\left(n - \frac{7}{3}\right) + 1.$

$$\frac{2}{3}n - \frac{5}{4} = -\frac{1}{3}n + \frac{7}{9} + 1$$

$$36 \cdot \left(\frac{2}{3}n - \frac{5}{4}\right) = \left(-\frac{1}{3}n + \frac{7}{9} + 1\right) \cdot 36$$

$$24n - 45 = -12n + 28 + 36$$

$$24n - 45 = -12n + 64$$

$$36n - 45 = 64$$

$$36n = 109$$

$$n = \frac{109}{36}$$

$$\left\{ \frac{109}{36} \right\}$$

13. (5 pts) Solve:  $-3(-2-d) - d < 3(d-4) + 5d.$  Write the solution in interval notation and graph.

$$6 + 3d - d < 3d - 12 + 5d$$

$$6 + 2d < 8d - 12$$

$$6 < 6d - 12$$

$$18 < 6d$$

$$3 < d$$

i)  $(3, \infty)$



14. (5 pts) Solve:  $4 \leq -4x + 4 < 20.$  Write the solution in interval notation and graph.

$$0 \leq -4x < 16$$

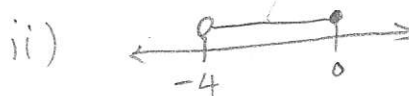
$$\frac{0}{-4} \geq \frac{-4x}{-4} > \frac{16}{-4}$$

$$0 \geq x > -4$$

or

$$-4 < x \leq 0$$

i)  $(-4, 0]$



Side Work

$$\frac{1}{\frac{5}{3}} \cdot \frac{4^2}{8^1} = \frac{2}{3}$$

$$\frac{5}{8^2} \cdot \frac{2^1}{2} = \frac{5}{4}$$

$$\frac{12}{36^1} \cdot \frac{2}{8^1} = 24$$

$$\frac{36^9}{1} \cdot \frac{5}{4^1} = 45$$

$$\frac{1}{8^1} \cdot \frac{36^{12}}{1} = 12$$

$$\frac{7}{8^1} \cdot \frac{26^4}{1} = 28$$

15. (5 pts) Solve for  $r$ :  $t = k - 2(hr + d)$ .

$$t = k - 2hr - 2d$$

$$t - k = -2hr - 2d$$

$$t - k + 2d = -2hr$$

$$\frac{t - k + 2d}{-2h} = r //$$

16. (5 pts) The circumference of a circle is  $45\pi$  in. Find the measure of its radius and diameter.

$$C = 45\pi$$

$$r = ?$$

$$d = ?$$

$$C = 2\pi r$$

$$45\pi = 2\pi r$$

$$\frac{45\pi}{2\pi} = r$$

$$22.5 = r$$

$$\text{radius} = 22.5 \text{ in} //$$

$$\text{diameter} = (22.5)(2)$$

$$= 45 \text{ in} //$$

17. (5 pts) 78 is 6% of what number?

$$78 = 0.06 \cdot x$$

$$\frac{78}{0.06} = x$$

$$\frac{7800}{6} = x$$

$$1300 = x$$

side

$$6\% = 0.06$$

$$\frac{78}{0.06} = \frac{7800}{6}$$

18. (5 pts) Three times the second of three consecutive even integers is 14 more than the sum of the first and third integers. Find the middle number. (show in 3-step format)

$$\begin{array}{l} \textcircled{1} \quad 1^{\text{st}} \text{ even integer} = x \\ \quad 2^{\text{nd}} \quad \text{"} \quad \quad \quad = x+2 \\ \quad 3^{\text{rd}} \quad \text{"} \quad \quad \quad = x+4 \end{array}$$

$$\begin{array}{l} \textcircled{2} \quad 3(x+2) = (x + x+4) + 14 \\ \quad 3x + 6 = 2x + 4 + 14 \\ \quad 3x + 6 = 2x + 18 \\ \quad x + 6 = 18 \\ \quad x = 12 \end{array}$$

$$\textcircled{3} \quad 2^{\text{nd}} \text{ even integer} = 12 + 2 = 14 //$$

19. (5 pts) One angle of a triangle is  $15^\circ$  more than the measure of the second angle. The third angle is  $15^\circ$  less than the measure of the second angle. Find the measure of the third angle.

$$\begin{array}{l} \textcircled{1} \quad \text{measure of } \angle 1 = x + 15 \\ \quad \quad \quad \text{"} \quad \quad \quad \angle 2 = x \\ \quad \quad \quad \text{"} \quad \quad \quad \angle 3 = x - 15 \end{array}$$

$$\begin{array}{l} \textcircled{2} \quad (x+15) + x + (x-15) = 180^\circ \\ \quad \quad \quad 3x = 180 \\ \quad \quad \quad x = 60 \end{array}$$

$$\begin{array}{l} \textcircled{3} \quad \text{measure of } \angle 3 = 60 - 15 \\ \quad \quad \quad = 45^\circ \end{array}$$