

# ASSIGNMENT # 1

## SOLUTIONS

1.1

① 2)  $(12+6) \div 3 = 18 \div 3 = 6$

(8)  $5(3+2) - 12 \div 3 = 25 - 4 = 21$

(10)  $3 \times (9-3) \div 6 = 18 \div 6 = 3$

(14)  $\frac{20-16}{15+5} = \frac{4}{20} = \frac{1}{5}$

(16)  $(3 \times 4 - 2)^2 + (2 - 2 \times 7^2) = (10)^2 + (-96) = 4$

1.2

① 2)  $\frac{28}{56} = \frac{1}{2}$       8)  $\frac{360}{288} = \frac{5}{4}$       10)  $\frac{115}{365} = \frac{23}{73}$

③ 2)  $\frac{7}{4} = 1.75$       4)  $\frac{5}{6} = 0.8\bar{3}$       6)  $\frac{7}{9} = 0.\bar{7}$

8)  $\frac{19}{15} = 1.2\bar{6}$

④ 2)  $3\frac{2}{5} = 3.4$       8)  $7\frac{1}{12} = 7.08\bar{3}$

⑤ 4)  $253.4856 \approx 253.49$       8)  $39.999 \approx 40.00$

⑥ 2)  $\frac{264}{4400 \times \left(\frac{146}{365}\right)} = \frac{264}{4400 \times 0.4} = \frac{264}{1760} = 0.15$

$$5) \$2100 \left(1 - 0.135 \times \frac{240}{365}\right) = \$2100 (0.9112328767) \\ \approx \$1913.59$$

$$10) \frac{\$2901}{1 - 0.165 \times \frac{73}{365}} = \frac{\$2901}{1 - (0.165)(0.2)} = \frac{\$2901}{0.967} = \$3000$$

1.3

$$(A) 4) 0.1\% = 0.001 \quad 12) 95\% = 0.95$$

$$20) 112\frac{1}{2}\% = 112.5\% = 1.125$$

$$(B) 8) 225\% = \frac{225}{100} = \frac{9}{4} \quad 12) 87\frac{1}{2}\% = \frac{87\frac{1}{2}}{100} = \frac{175}{200} = \frac{7}{8}$$

$$26) 7.5\% = \frac{7.5}{100} = \frac{75}{1000} = \frac{3}{40}$$

$$(C) 4) 0.375 = 37.5\% \quad 6) 2 = 200\%$$

$$22) \frac{5}{8} = 0.625 = 62.5\%$$

1.4

$$(A) 2) \text{TOTAL COST OF LABOUR} = (\# \text{ OF HOURS}) (\# \text{ PER HOUR})$$

$$= \left(15\frac{1}{2} + 13\frac{3}{4} + 18\frac{1}{2} + 21\frac{1}{4} + 22\frac{3}{4}\right) (12.75)$$

$$= (91.75)(12.75)$$

$$= \$1169.81$$

$$\begin{aligned}
 4) \text{ CREDIT PER ITEM} &= (\text{RETAIL PRICE}) - (\text{DISCOUNT}) \\
 &= 0.83 - \left(\frac{3}{8}\right)(0.83) \\
 &= 0.83 - (0.375)(0.83) \\
 &= 0.52083
 \end{aligned}$$

$$\begin{aligned}
 \text{AMOUNT OF CREDIT} &= (\# \text{ OF ITEMS})(\text{CREDIT PER ITEM}) \\
 &= (2700)(0.52083) \\
 &= \$1406.25
 \end{aligned}$$

6)

<u>ITEM</u>	<u>QUANTITY</u>	<u>COST PER UNIT</u>	<u>TOTAL</u>
1	96	\$0.875	\$84.00
2	330	16 $\frac{2}{3}$ ¢	\$55.00
3	144	\$1.75	\$252.00
4	240	\$1.66	\$400.00
		TOTAL	<u>\$791.00</u>

3) 2) a) AVERAGE # OF LITRES PER PURCHASE =  $\frac{\# \text{ LITRES}}{\# \text{ PURCHASED}}$

$$\begin{aligned}
 &= \frac{56 + 64 + 70 + 54}{4} \\
 &= 61 \text{ LITRES PER PURCHASE}
 \end{aligned}$$

b) TOTAL COST =  $(56)(649) + (64)(0.605) + (70)(0.515) + (54)(.545)$

$$= \$131.64$$

TOTAL # OF LITRES =  $56 + 64 + 70 + 54 = 244$

$$\text{AVERAGE COST} = \frac{\text{TOTAL COST}}{\text{TOTAL \# OF LITRES}}$$

$$= \frac{\$131.64}{244}$$

$$= \$0.54 \text{ PER LITRE}$$

OR

$$54 \text{ CENTS PER LITRE}$$

2.1 (A) 2)  $6m - 2m - m = 3m$       8)  $9c - 8d - 7c + 5d = 2c - 3d$

12)  $x - 0.02x = 0.98x$       18)  $-(4-5a) - (-2+3a)$   
 $= 2a - 2$

(B) 2)  $-7(8a) = -56a$

6)  $-6m(-4m) = 24m^2$

10)  $5(2x-4) = 10x-20$

18)  $(5m-2n)(m-3n) = 5m^2 - 15mn - 2nm + 6n^2$   
 $= 5m^2 - 17mn + 6n^2$

20)  $(a-1)(a^2-2a+1) = a^3 - 2a^2 + a - a^2 + 2a - 1$   
 $= a^3 - 3a^2 + 3a - 1$

22)  $2(a-1)(2a-3) - 3(3a-2)(a+1)$   
 $= 2[2a^2 - 3a - 2a + 3] - 3[3a^2 + 3a - 2a - 2]$   
 $= 4a^2 - 10a + 6 - 9a^2 - 3a + 6$   
 $= -5a^2 - 13a + 12$

26)  $(-42ab) \div (7ab) = -6$

$$30) (-a^3 - 4a^2 - 3a) \div (-a) = a^2 + 4a + 3.$$

$$2) \frac{1}{2}(3x^2 - x - 1) - \frac{1}{4}(5 - 2x - x^2) \text{ FOR } x = -3$$

$$= \frac{1}{2}(3(-3)^2 - (-3) - 1) - \frac{1}{4}(5 - 2(-3) - (-3)^2)$$

$$= \frac{1}{2}(3 \cdot 9 + 3 - 1) - \frac{1}{4}(5 + 6 - 9)$$

$$= \frac{29}{2} - \frac{1}{4}(2)$$

$$= \frac{29}{2} - \frac{1}{2}$$

$$= \frac{28}{2}$$

$$= 14$$

$$0) \frac{2NC}{P(n+1)} \text{ FOR } N=52, C=60, P=1800, n=25$$

$$= \frac{2(52)(60)}{(1800)(25+1)} = \frac{2}{15}$$

$$2) FV(1 - rt) \text{ FOR } FV=1200, r=0.175, t = \frac{256}{365}$$

$$= 1200(1 - 0.175(\frac{256}{365})) = 1052.71$$

$$14) \frac{FV}{1+rt} \text{ FOR } FV=1752, r=0.152, t = \frac{228}{365}$$

$$= \frac{1752}{1 + 0.152(\frac{228}{365})} = 1600.08$$

2.2

$$A) 2) 15=1 \quad 4) (-1)^2=1 \quad 6) (\frac{5}{6})^4 = \frac{625}{1296}$$

$$10) (2.2)^6 \approx 113.38$$

$$\textcircled{B} 2) (-4)^3 \times (-4) = (-4)^4$$

$$6) [(-4)^3]^6 = (-4)^{18}$$

$$10) (-1)^3 (-1)^7 (-1)^5 = (-1)^{15}$$

$$16) \left(-\frac{3}{4}\right)^8 \div \left(-\frac{3}{4}\right)^7 = \left(-\frac{3}{4}\right)^1 = -\frac{3}{4}$$

$$28) \left(\frac{a^3 b^2}{x}\right)^4 = \frac{a^{12} b^8}{x^4}$$

$$32) \left(\frac{1+i}{i}\right)^{-n} = \left(\frac{i}{1+i}\right)^n = \frac{i^n}{(1+i)^n}$$

$$\underline{2.3} \textcircled{A} 2) \sqrt{205.4225} = 14.35 \quad 4) \sqrt[10]{1.046221} \approx 1.00$$

$$\textcircled{B} 2) \sqrt[4]{2401} = 7 \quad 6) \sqrt[6]{1.095} \approx 1.02$$

$$10) \frac{1 - 1.05^{-36}}{0.05} \approx 16.55$$

$$\underline{2.4} \textcircled{A} 2) 3^7 = 2187 \rightarrow \log_3 2187 = 7$$

$$4) 10^{-5} = 0.00001 \rightarrow \log_{10} 0.00001 = -5$$

OR

$$\log 0.00001 = -5$$

$$\textcircled{B} 2) \log_3 \frac{1}{81} = -4 \rightarrow 3^{-4} = \frac{1}{81}$$

$$4) \ln e^2 = 2 \rightarrow e^2 = e^2$$

$$2) \ln 200 \approx 5.30$$

$$4) \ln [300(1.10^{15})] = \ln 300 + \ln 1.10^{15} \\ = \ln 300 + 15 \ln 1.10 \approx 7.13$$

$$6) \ln \left[ 850 \left( \frac{1.01^{-120}}{0.01} \right) \right] = \ln 850 + \ln \left( \frac{1.01^{-120}}{0.01} \right) \\ = \ln 850 + \ln 1.01^{-120} - \ln 0.01 \\ = \ln 850 - 120 \ln 1.01 - \ln 0.01 \\ \approx 10.16$$

$$2.5 \text{ (A) } 2) -7x = 35 \\ x = \frac{35}{-7}$$

$$x = -5$$

$$6) -\frac{1}{8}x = 7 \\ x = (-8)(7) \\ x = -56$$

$$10) -2x = 7 - 3x \\ x = 7$$

$$\text{(B) } 2) 5 - 4x = -4 - x \\ 9 = 3x \\ \frac{9}{3} = x \\ 3 = x$$

$$6) 16x - 12 = 6x - 32 \\ 10x = -20 \\ x = \frac{-20}{10} \\ x = -2$$

$$8) -3 + 2x + 5 = 5x - 36 + 14 \\ 24 = 3x \\ \frac{24}{3} = x \\ 8 = x$$

2.6

$$\textcircled{A} 2) -3(1-11x) + (8x-15) = 187$$

$$-3 + 33x + 8x - 15 = 187$$

$$41x = 205$$

$$x = \frac{205}{41}$$

$$x = 5$$

$$8) -2(x-4) + 12(3-2x) = -8$$

$$-2x + 8 + 36 - 24x = -8$$

$$-26x = -52$$

$$x = \frac{-52}{-26}$$

$$x = 2$$

$$\textcircled{B} 2) x + \frac{5}{8}x = 26$$

$$\frac{13}{8}x = 26$$

$$x = \frac{(8)(26)}{13}$$

$$x = 16$$

$$6) 2 - \frac{3}{2}x = \frac{2}{3}x + \frac{31}{9}$$

$$2 - \frac{31}{9} = \frac{2}{3}x + \frac{3}{2}x$$

$$-\frac{13}{9} = \frac{13}{6}x$$

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

$$\textcircled{C} 2) \frac{4}{5}(4-3x) + \frac{53}{40} = \frac{3}{10}x - \frac{7}{8}(2x-3) \quad \text{LCD} = 40$$

$$8 \cancel{40} \left( \frac{4}{5} \right) (4-3x) + 40 \left( \frac{53}{40} \right) = \cancel{40} \left( \frac{3}{10}x \right) - \cancel{40} \left( \frac{7}{8} \right) (2x-3)$$

$$32(4-3x) + 53 = 12x - 35(2x-3)$$

$$128 - 96x + 53 = 12x - 70x + 105$$

$$76 = 38x$$

$$2 = x$$

$$4) \frac{4}{3}(3x-2) - \frac{3}{5}(4x-3) = \frac{11}{60} + 3x \quad \text{LCD} = 60$$

$$20 \cancel{60} \left(\frac{4}{3}\right)(3x-2) - \cancel{60} \left(\frac{3}{5}\right)(4x-3) = \cancel{60} \left(\frac{11}{60}\right) + 60(3x)$$

$$80(3x-2) - 36(4x-3) = 11 + 180x$$

$$240x - 160 - 144x + 108 = 11 + 180x$$

$$-63 = 84$$

$$-\frac{3}{4} = x$$

$$5) 2) Q = \frac{P - q}{2} \quad \text{SOLVE FOR } P$$

$$2Q = P - q$$

$$2Q + q = P$$

$$6) P = S(1+i)^{-n} \quad \text{SOLVE FOR } i$$

$$P = \frac{S}{(1+i)^n}$$

$$P(1+i)^n = S$$

$$(1+i)^n = \frac{S}{P}$$

$$(1+i) = \sqrt[n]{\frac{S}{P}}$$

$$i = \sqrt[n]{\frac{S}{P}} - 1$$