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B012

UEB Maths and Science Practice Exercises

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Exercise 1

(a) $3.2 \times 0.4 = 1.28$

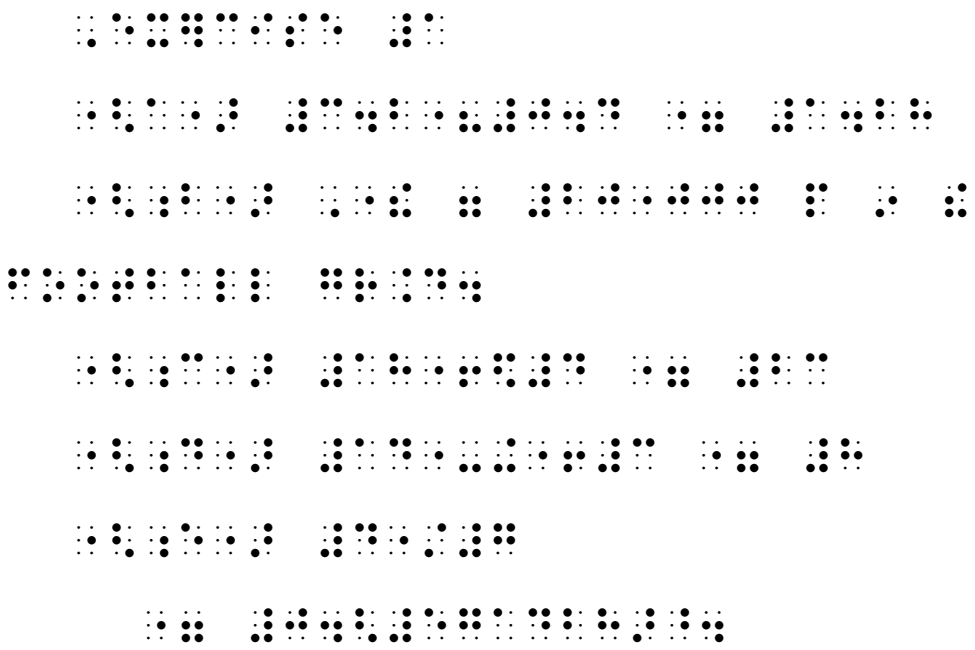
(b) There were 20 000 people in the football ground.

(c) $18 + \square = 23$

(d) 14 - + 3 = 8

(e) $4 \div 7 = 0.\dot{5}71428\dot{}$

Answers



Exercise 2

(a) Work out $\frac{1}{4}$ of 48

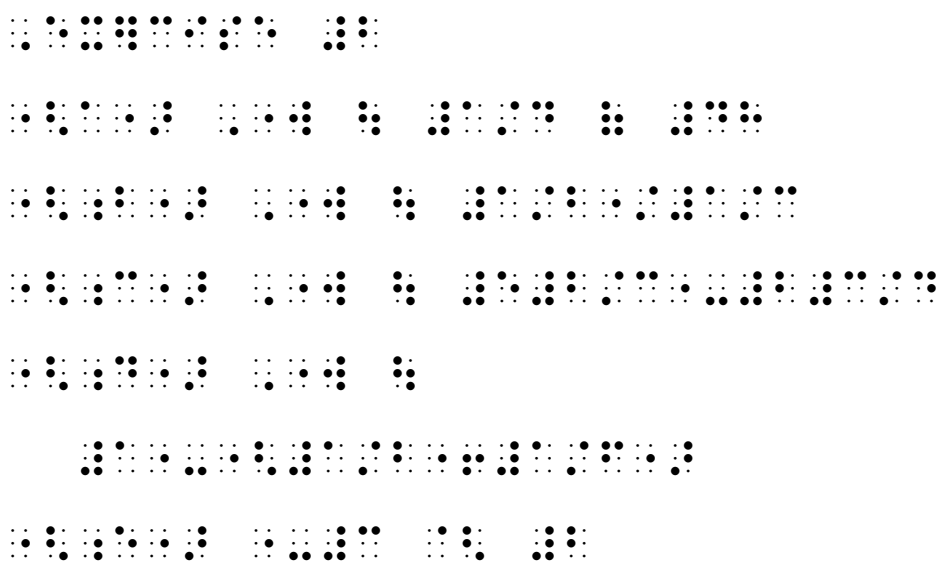
(b) Work out $\frac{1}{2} \div \frac{1}{3}$

(c) Work out $5\frac{2}{3} - 2\frac{3}{4}$

(d) Work out $1 - \left(\frac{1}{2} + \frac{1}{6}\right)$

(e) $-3 < 2$

Answers



Exercise 3

a. $\frac{x}{y}$

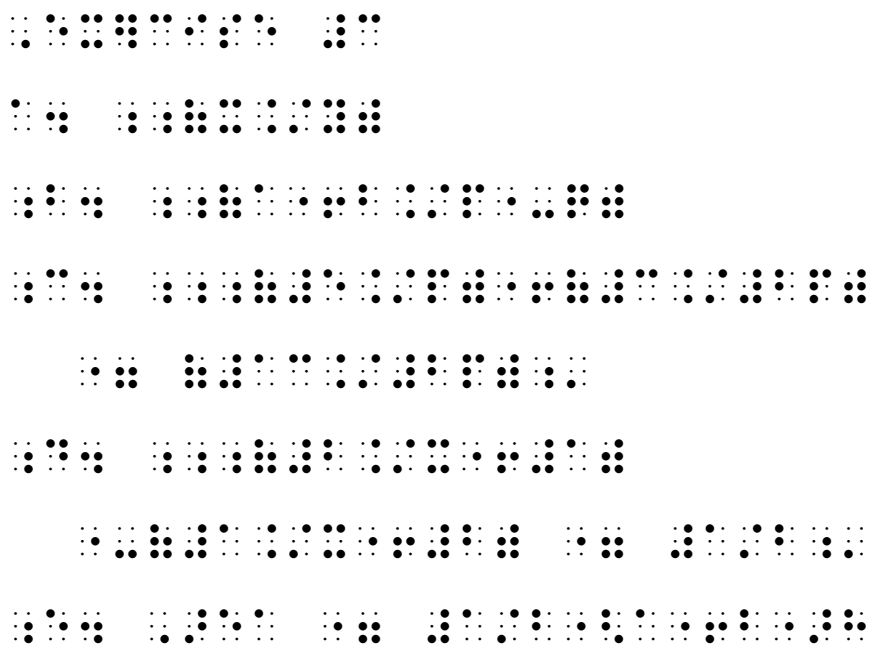
b. $\frac{a+b}{p-q}$

c. $\frac{5}{p}+\frac{3}{2p}=\frac{13}{2p}$

d. $\frac{2}{x+1}-\frac{1}{x+2}=\frac{1}{2}$

e. Area $=\frac{1}{2}(a+b)h$

Answers



Exercise 4

a. 1/2 + 3/4 = 5/4

b. 36%

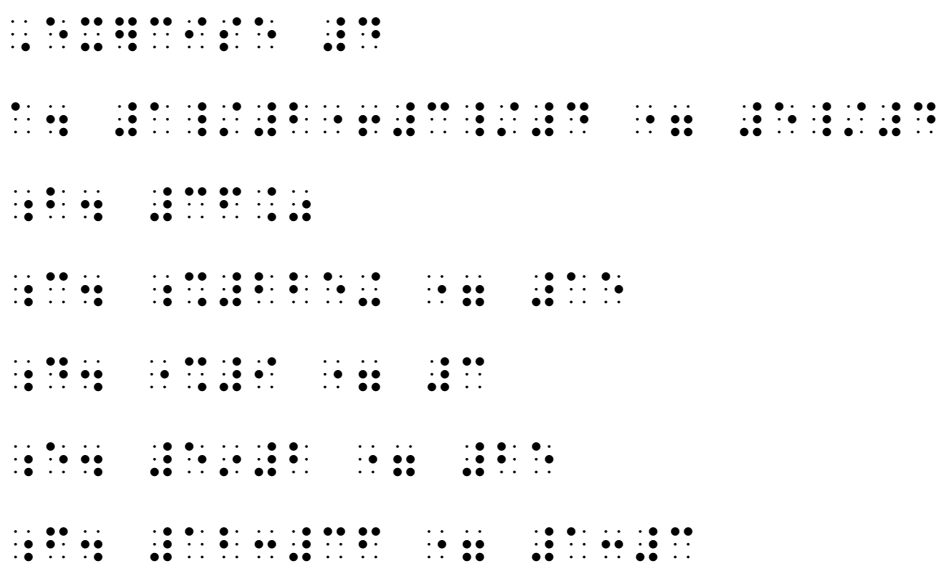
c. $\sqrt{225} = 15$

d. $\sqrt{9} = 3$

e. $5^2 = 25$

f. $12 : 36 = 1 : 3$

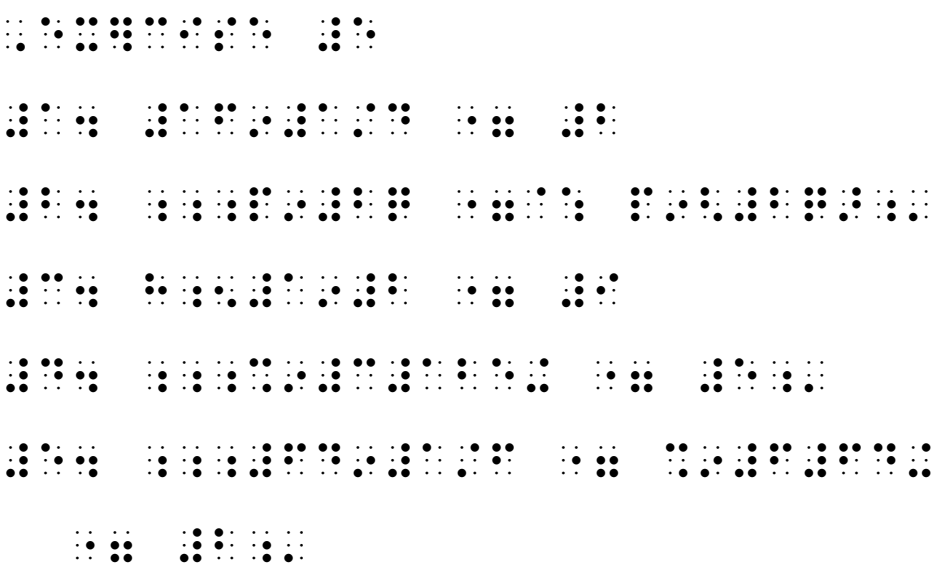
Answers



Exercise 5

1. $16^{\frac{1}{4}} = 2$
2. $p^2q \neq p^{2q}$
3. $h_1^{\ 2} = 9$
4. $\sqrt[3]{125} = 5$
5. $64^{\frac{1}{6}} = \sqrt[6]{64} = 2$

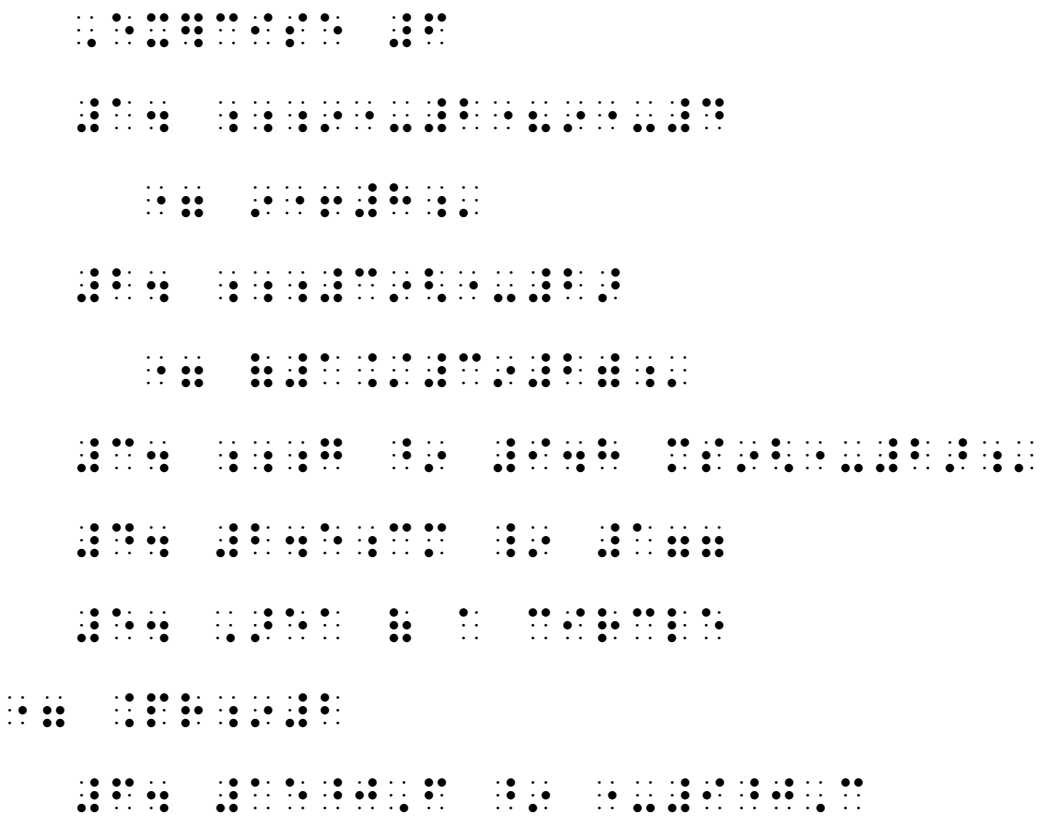
Answers



Exercise 6

1. $^{-}2 \times {}^{-}4 = {}^{+}8$
2. $3^{-2} = \frac{1}{3^2}$
3. $g \approx 9.8\ ms^{-2}$
4. $2.5cm \simeq 1''$
5. Area of a circle = πr^2
6. $15°F \approx -9°C$

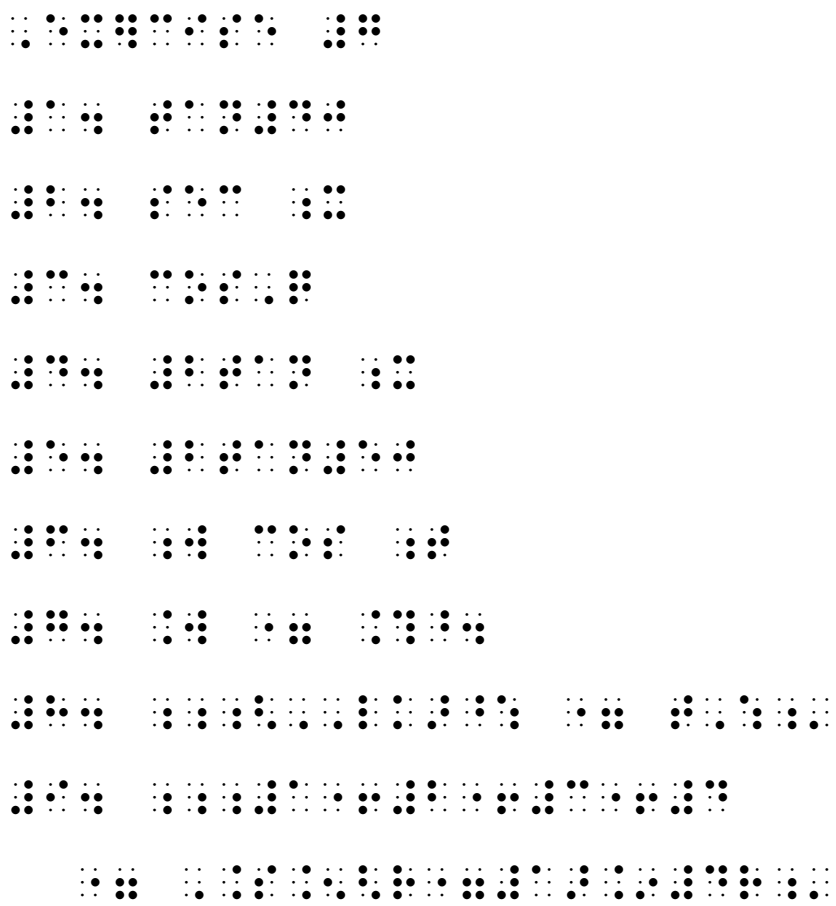
Answers



Exercise 7

1. $\tan 40$
2. $\sec x$
3. $\cos Q$
4. $2\tan x$
5. $2\tan 50$
6. $w\cos t$
7. $\omega = \dot{\theta}$
8. $\overrightarrow{LK} = \underline{t}$
9. $1+2+3+4 = \sum_{r=1}^{4} r$

Answers



Exercise 8

1. $\overrightarrow{PQ} = \begin{pmatrix} 4 \\ 5 \\ 6 \end{pmatrix}$

2. $\alpha = \frac{d\omega}{dt} = \ddot{\theta}$

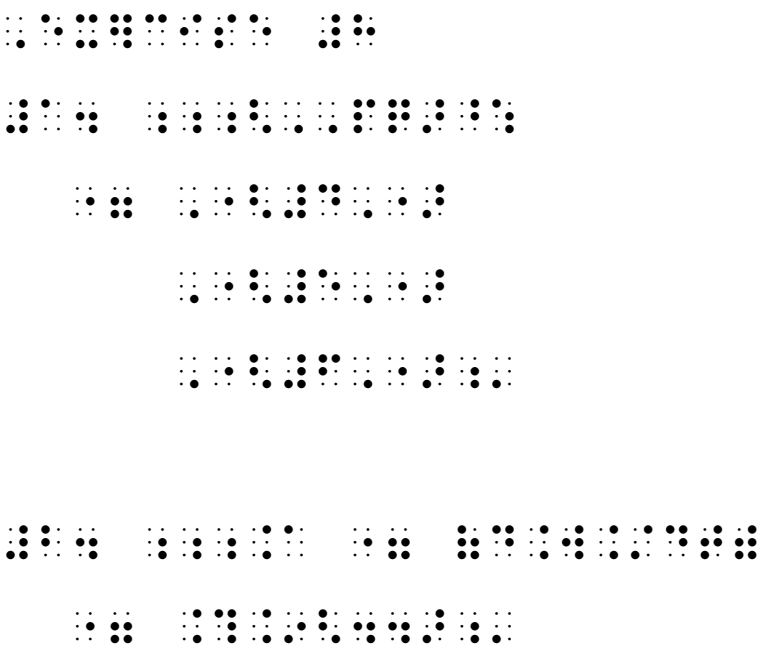
3. $\int_1^3 x^2 dx = \left[\frac{x^3}{3}\right]_1^3 = \frac{27}{3} - \frac{1}{3} = \frac{26}{3}$

4. $\mathbf{a} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

5. $\begin{pmatrix} 11 & -4 \\ -5 & 10 \end{pmatrix}$

6. $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}\begin{pmatrix} 5 & 6 \\ 7 & 8 \end{pmatrix} = \begin{pmatrix} 5+14 & 6+16 \\ 15+28 & 18+32 \end{pmatrix} = \begin{pmatrix} 19 & 22 \\ 43 & 50 \end{pmatrix}$

Answers



Exercise 9

a. If $P = \{4, 8, 12\}$ and $B = \{\text{even numbers}\}$ then $A \subset B$

b. If $D = \{\text{ford, saab, nissan, renault}\}$ then $\text{ford} \in D$

c. $P' \cup Q' = (P \cap Q)'$

d. $S_{xy} = \sum(x_i - \bar{x})(y_i - \bar{y})$

e. $\sum_{i=1}^{5} x_i$

f. ${}^{6}C_{2} = \binom{6}{2}$

Answers

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Exercise 10

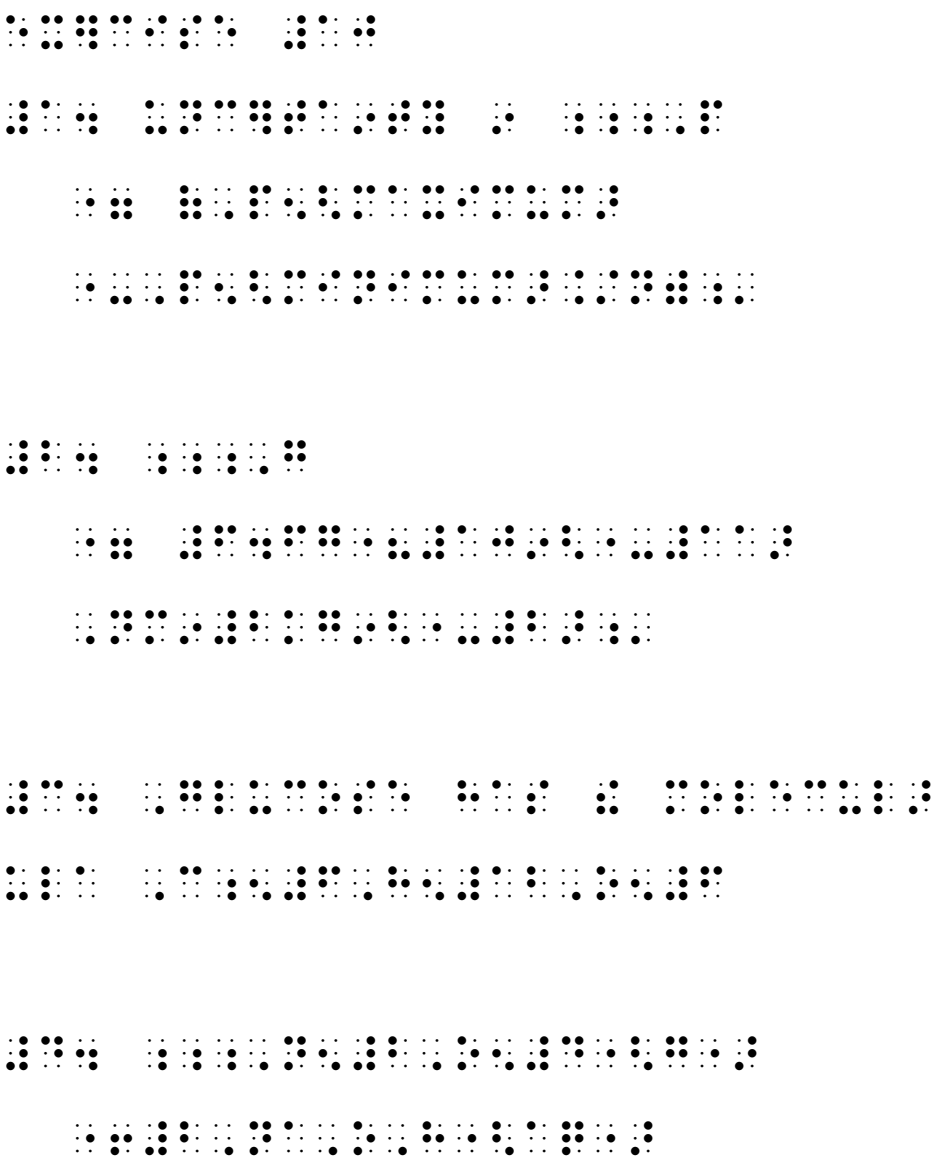
1. uncertainty in P = $\frac{P_{maximum} - P_{minimum}}{n}$

2. $G = 6.67 \times 10^{-11} Nm^2kg^{-2}$

3. Glucose has the molecular formula $C_6H_{12}O_6$

4. $N_2O_4(g) + 2NaOH(aq) \rightarrow NaNO_3(aq) + NaNO_2(aq) + H_2O(l)$

Answers



Exercise 11 (Extended practice)

(a) $8.6 \div 0.2 = 43$

(b) The world's population on 30/01/2014 at 13 14 was

7 209 860 703

(c) 7+□+3=15

(d) $4 \div 3 = 1.\dot{3}$

(e) Work out $4\frac{2}{5} - \frac{3}{5}$

(f) Write $\frac{2x+4}{x-1} \times \frac{1}{x+2}$ as a single fraction in its simplest form.

(g) Simplify $\frac{4y^5 + 2y^3}{y^2}$

(h) Change \$5.20 into pounds if £1 = \$1.62.

(i) Find $4\frac{1}{2}\%$ of €450.50.

(j) Work out $(3.5 \times 10^{-6}) \div (5 \times 10^4)$

(k) Is $4 \times 5 > 10 \times 2$?

(l) Solve $(x-2)(2x+5) = 4(x+3)$

(m) Solve $\begin{pmatrix} -2 \\ 3 \end{pmatrix} + \begin{pmatrix} -37 \\ y+2 \end{pmatrix} = \begin{pmatrix} x \\ 9 \end{pmatrix}$

(n) Volume of a sphere = $\frac{4}{3}\pi r^3$

(o) Solve $\sin\theta \sin\left(\frac{\pi}{3}\right) + \cos\theta \sin\left(\frac{\pi}{3}\right) = 0.5$

(p) $\sqrt[4]{16} = 2$

(q) $27^{\frac{1}{3}} = \sqrt[3]{27} = 3$

(r) $x^2 + y^2 = 25$

(s) $2P(g) + 2Q(g) \rightarrow R(g) + S(g)$

(t) $\bar{x} = \frac{1}{n}\sum_{1}^{n} x$

(u) Time for a drink!

Coffee $C_8H_{10}N_4O_2$ and water H_2O plus milk.

Answers

Disclaimer

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