TRANSPOSITION OF FORMULAE YEARS 9 AND 10

1 If a = bx + c, then:

$$A \qquad x = \frac{a+c}{b}$$

$$\mathbf{B} \qquad x = \frac{a}{b} - c$$

C
$$x = \frac{a-c}{b}$$

D
$$x = \frac{a}{b+c}$$

2 If $M = \frac{N-V}{P}$, then:

$$A \qquad P = \frac{N - V}{M}$$

$$\mathbf{B} \qquad N = MP - V$$

$$C \qquad V = \frac{N}{P} - M$$

$$D \qquad V = \frac{N - M}{P}$$

3 If
$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$
, then

$$A f = u + v$$

B
$$f = \frac{u+v}{uv}$$

$$C f = \frac{uv}{u+v}$$

$$\mathbf{D} \qquad f = uv$$

4 If
$$m = \sqrt{n+p}$$
, then:

$$A \qquad n = (m-p)^2$$

B
$$n=m^2-p$$

C
$$n = m - p$$

$$D \qquad n = \sqrt{m^2 - p}$$

5 If
$$a = b\sqrt{c}$$
, then:

A
$$c = a^2 - b^2$$

$$B \qquad c = \frac{a^2}{b^2}$$

$$C \qquad c = \frac{b}{a}$$

$$D c = \sqrt{\frac{a}{b}}$$

6 If
$$ab - c = a + b$$
, then:

$$A \qquad a = c + 1$$

$$\mathbf{B} \qquad a = \frac{b-1}{b+c}$$

$$C \qquad a = \frac{b-c}{b+1}$$

$$D \qquad a = \frac{b+c}{b-1}$$

7 If $x = \frac{p-w}{m-w}$, then w is equal to:

$$A \qquad \frac{mx - p}{1 - x}$$

B
$$\frac{mx-p}{x-1}$$

$$C \qquad \frac{p-x}{m-x}$$

D
$$-\frac{mx}{p}$$

8 If $a = \sqrt{\frac{b+c}{d}}$, then c is equal to:

A
$$a^2d-b$$

B
$$\left(\sqrt{a} d - b\right)^2$$

$$C \qquad a^2 - bd$$

$$D = \frac{a^2d}{b}$$

9 If $a = \frac{bc^2}{3} + \frac{bd}{12}$, then b is equal to:

$$A \frac{12a-4c^2}{d}$$

$$B = \frac{36a}{c^2 + d}$$

$$C \qquad \frac{a-12}{4c^2+d}$$

$$D = \frac{12a}{4c^2 + d}$$

The value of *d*, given b = -4, c = 12, a = 4 and $d = \frac{1}{4}\sqrt{a(c-b)}$, is: **10**

A
$$\sqrt{8}$$

B 4
D
$$\frac{\sqrt{8}}{2}$$

Celsius temperature C and Fahrenheit temperature F are related by the formula 11 $C = \frac{5}{9}(F - 32)$. If water boils at 100 degrees Celsius, its equivalent Fahrenheit temperature is:

D
$$132\frac{5}{9}$$
 °F

If $ab = c^2$, then c is equal to: 12

A
$$\sqrt{ab}$$

B
$$\pm \sqrt{ab}$$

$$C = \frac{ab}{2}$$

$$D a^2b^2$$

13 If
$$\frac{1}{a} = \frac{1}{b} + \frac{1}{c}$$
 then:

A
$$b = a - c$$

B
$$b = \frac{ac}{a-c}$$

$$C b = \frac{ac}{c - a}$$

D
$$b = \frac{ac}{a+c}$$

The distance d (km) which a girl can see when she is at a height h (m) above the 14 ground is given by the formula $d = 8\sqrt{\frac{h}{5}}$. If a girl is 125 m above the ground, she can see a distance of:

17.9 km Α

В 20 km

 \mathbf{C} 40 km D 400 km

Now density d is related to mass m and volume v by the formula $d = \frac{m}{n}$. If a 15 particular plastic object is to have a volume of 12 cm³, and the plastic has density 1.5 g per cm³, its mass must be:

18 g A C 0.125 g

B 8 g D 13.5 g

If ab = c + d, and $b = 2 \times 10^{-3}$, $c = 4 \times 10^{5}$ and $d = 6 \times 10^{5}$, then a is equal to: 16

A 5×10^8 C 2×10^3

If $a = \sqrt{3}$, $b = 1 + \sqrt{3}$ and $c = (a - b)^2$, then c is equal to:

Α

C -1 D

The electrical resistance of a certain metal wire R (ohms) is given by $R = \frac{l}{10d^2}$ 18 where l (mm) is the length of the wire and d (mm) is its diameter. An electronics engineer needs to cut a sufficient length to have a resistance of 100 ohms. If the diameter of the wire is 0.5 mm, the length of wire needed is:

0.025 mm A

250 mm В

C 400 mm D 2500 mm

19	The volume of a cone V (cm ³) is given by $V = \frac{1}{3} \pi r^2 h$ where $\pi \approx 3$, r (cm) is the
	radius of the cone and h (cm) is its perpendicular height. The volume of a cone of radius 2 cm and height 10 cm approximately equals:

A
$$13\frac{1}{3}$$
 cm³

 $B = 40 \text{ cm}^3$

$$C 120 \text{ cm}^3$$

D 1600 cm^3

20 If you are travelling at a steady pace, your speed S (km/hr) is related to the distance you travel d (km/hr) and the time taken t (hours) by:

$$S = \frac{d}{t}$$

The amount of time taken to fly over a distance of 1000 km if your aircraft is going at 400 km/h is:

B $2\frac{1}{2}$ hours

D 400,000 hours

21 A graph has the rule $y = 4x^3 - 6x^2 + 2x + 3$. If the x co-ordinate of a certain point is $-\frac{1}{2}$, its y co-ordinate will be:

B 1

The distance d (km) you can see from a height h (m) is given by $d = 8\sqrt{\frac{h}{5}}$. To see a distance of 16 km, the height you need to be at is:

 $B \hspace{0.2in} 20 \hspace{0.2in} m$

D 320 m

For a vehicle accelerating along a straight road at a steady rate a (metres/sec²), its final speed V (m/s) is related to its initial speed u (m/s) and the time over which it accelerates t (seconds) by v = u + at. If a motorcyclist accelerates at 10 m/s², how many seconds will she take to speed up from 20 m/s to 50 m/s?

B 7

D 40

The final volume of a gas V (cm³) enclosed in a balloon which is being exposed to heat is given by V = u(kt + 1) where u (cm³) is its volume at 0° C, k is a constant number which is related to the lowest possible temperature on Earth, and t is its temperature (°C). If a balloon is filled at 0° C with 100 cm^3 neon gas, it expands to 118 cm^3 at 50° C. The value of k must be:

A -0.0031

В 0.0036

C 0.0136

D 0.0234

The amount you will have in the bank if you invest \$P for t years at an interest rate R% per annum, if interest is calculated once a year, is given by

$$A = P\left(1 + \frac{R}{100}\right)^t$$

The amount you will have if you invest \$10 000 at 11% per annum for 5 years is:

A \$16 850.58

В \$50 055

C \$55 500

D \$60 000

ANSWERS TO WORKSHEET ON TRANSPOSITION OF FORMULAE

6 D	5 B	4 B	3 C	2 A	1 C
12 B	11 C	10 C	9 D	8 A	7 B
18 B	17 D	16 A	15 A	14 C	13 C
24 B	23 A	22 A	21 A	20 B	19 B
	23 A	22 A	21 A	20 B	19 B 25 A