

This assessment will be a one period in class exam on March 13. The questions will be a selection from the questions below.

- 1)! Evaluate $\frac{45.8 \times 7.6}{22.9}$.
- 2)! Evaluate $\frac{1}{2.5 \times 0.3125}$.
- 3)! Evaluate $\frac{3.216 \times 10^9}{4.8 \times 10^{-6}}$.
- 4)! Round off 0.0532 (to 1 significant figure).
- 5)! Round off 3.807×10^{-5} (to 3 significant figures).
- 6)! Write $(0.00237 \times 10^{-6})(1246.22 \times 10^{-5})$ in scientific notation (round off to 4 s.f.).
- 7)! Write 133.3% as a mixed number.
- 8)! Write 8.3% as a fraction in its simplest form.
- 9)! Decrease \$84.75 by 67%.
- 10)! In 1993 Australia imported machinery and transport equipment to the value of \$27.456 billion. This represented 44% of the total imports for the year. What was the total value (in \$ billion) of Australian imports for 1993?
- 11)! Express $\frac{5}{99}$ as a recurring decimal.
- 12)! Express $0.\dot{4}3\dot{8}$ as a common fraction.
- 13)! Express $0.\dot{2}7\dot{6}$ as a common fraction.
- 14)! Express $0.\dot{3}\dot{4}$ as a common fraction.
- 15)! Evaluate correct to 2 d.p. $\frac{3.7 \times 9.8 + 0.4 \times 6.1}{7.3 - 5.9}$.
- 16)! Evaluate correct to 2 d.p. $(8.7)^2 + 3.1 \div \sqrt{1.9}$.
- 17)! Evaluate correct to 2 d.p. $\sqrt{\frac{3.21 \times 10^4}{9.75 \times 10^{-6}}}$.
- 18)! Evaluate correct to 2 d.p. $\frac{245}{\sqrt{1.3 + 0.87}}$.
- 19)! Evaluate correct to 2 d.p. $\sqrt[3]{\frac{(8.9)^2}{\pi}}$.
- 20)! Evaluate correct to 2 d.p. $\sqrt{\frac{8.3 \div 2.4}{\pi}} + \frac{(0.5 - 2.3)^2}{6.7 \times 1.4}$.
- 21)! Calculate $3\sqrt{7}$ correct to 1 d.p.
- 22)! Between which two consecutive integers is $3\sqrt{45}$?
- 23)! Simplify $\sqrt{112}$.
- 24)! Simplify $\sqrt[3]{27}$.
- 25)! Simplify $2\sqrt{18x^3y}$.
- 26)! Simplify $\sqrt[3]{\frac{8x}{y^3}}$.
- 27)! Simplify $(\sqrt{\frac{3}{5}})^2$.
- 28)! Express $3\sqrt{3}$ as a complete radical.

- 29)! Simplify $2\sqrt{3} - 7\sqrt{3} + \sqrt{3}$.
- 30)! Simplify $\sqrt{75} + \sqrt{48}$.
- 31)! Simplify $2\sqrt{6} \times 5\sqrt{8}$.
- 32)! Simplify $\frac{2\sqrt{6} \times 3\sqrt{7}}{12\sqrt{21}}$.
- 33)! Expand and simplify $4\sqrt{3}(3\sqrt{12} + 2)$.
- 34)! Expand and simplify $(\sqrt{x+3} + \sqrt{x-2})(\sqrt{x+3} - \sqrt{x-2})$.
- 35)! Expand and simplify $(1 + \sqrt{3})^2$.
- 36)! Write $(2 + 3\sqrt{5})^2$ in the form of $a + b\sqrt{x}$.
- 37)! Rationalise the denominator of $\frac{6}{\sqrt{6}}$.
- 38)! Rationalise the denominator of $\frac{\sqrt{12} + \sqrt{18}}{3\sqrt{2}}$.
- 39)! Rationalise the denominator of $\frac{1}{\sqrt{5} + \sqrt{2}}$.
- 40)! Rationalise the denominator of $\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$.
- 41)! Show that $\frac{1}{3 + \sqrt{3}} + \frac{1}{3 - \sqrt{3}}$ is a rational number.
- 42)! Show that $\frac{(\sqrt{3} + \sqrt{2})^2 - 5}{2\sqrt{6}}$ is a rational number.
- 43)! Show that $a(\sqrt{a} - \frac{1}{\sqrt{a}})^2$ is a rational number given that a is a rational number.
- 44)! Show that $(a - b)^2 \left(\frac{\sqrt{a} + \sqrt{b}}{\sqrt{a} - \sqrt{b}} - \frac{\sqrt{a} - \sqrt{b}}{\sqrt{a} + \sqrt{b}} \right)^2$ is a rational number given that a and b are rational numbers.
- 45)! Simplify $2m - 3n - 2m + 3n$.
- 46)! Simplify $a^2x^2 - 3ay^2 + 2b^2x - x^2a^2 + 3a^2y - 2b^2x$.
- 47)! Expand then simplify $3(x - y) + 3y - x$.
- 48)! Expand then simplify $(x + 1)(x + 2)$.
- 49)! Expand then simplify $(11 - z)(6 + z)$.
- 50)! Expand then simplify $(9x + 2t)(4x - t)$.
- 51)! Expand then simplify $(3a + 4b)^2$.
- 52)! Expand then simplify $(x + 4)(x - 1) - (1 + x)(2 + x)$.
- 53)! Given the equation $y = mx + b$, find y when $m = 7.3$, $x = -9.8$ and $b = 12.4$.
- 54)! Given the equation of motion $v = u + at$, find v when $u = 60.4$, $a = 27$ and $t = 13.5$.
- 55)! The equation $\Delta G = \Delta H - T\Delta S$ is known as the Gibbs free - energy function. Find ΔH when $\Delta G = 398.2$, $T = 131.3$ and $\Delta S = -2.5$.
- 56)! The equation $T^2 = ca^3$ is known as Kepler's Third Law. Find the positive value of T (correct to 3 significant figures) when $c = 2.94 \times 10^{-19}$ and $a = 4.7 \times 10^{15}$.
- 57)! Given $M = \frac{m}{\sqrt{1 - \frac{v^2}{c^2}}}$, find v (correct to 3 significant figures) if $M = 2025$, $m = 1350$ and $c = 3 \times 10^8$.
- 58)! Factorise $ax + a^2y$.
- 59)! Factorise $\sqrt{5}a + \sqrt{15}ab$.
- 60)! Factorise $(a - 1)x - (a - 1)y$.

- 61)! Factorise $x^2y^3 + axy^2 - xy - a$.
- 62)! Factorise $a^2 - \frac{1}{4}$.
- 63)! Factorise $4f^2 - 25g^2$.
- 64)! Factorise $\frac{x^2}{y^2} - \frac{1}{a^2}$.
- 65)! Factorise $a^3 + 1$.
- 66)! Factorise $1 - 27a^3$.
- 67)! Factorise $a^3 - \frac{1}{8}$.
- 68)! Factorise $\frac{125s^3}{8} + \frac{g^3}{27}$.
- 69)! Factorise $x^6 + 1$.
- 70)! Factorise $x^6 - 64y^6$.
- 71)! Factorise $\frac{a^6}{b^9} + \frac{b^9}{a^6}$.
- 72)! Factorise $x^2 + 11x + 10$.
- 73)! Factorise $x^2 + 15x + 50$.
- 74)! Factorise $x^2 + 5xy + 6y^2$.
- 75)! Factorise $15x^2 + 16xy + 4y^2$.
- 76)! Factorise $x^2 - 16x + 60$.
- 77)! Factorise $6x^2 - 22x + 12$.
- 78)! Factorise $24x^2 - 14x - 5$.
- 79)! Factorise $x^4 + 4x^2 + 3$.
- 80)! Factorise $x^2 + \frac{3}{4}x + \frac{1}{8}$.
- 81)! Factorise $x^2 + 3\sqrt{7}x + 14$.
- 82)! Factorise $x^2 - 6x + 9$.
- 83)! Factorise fully $x^2 + 4x + 2$ by completing the square.
- 84)! Factorise fully $x^2 + 5x - 1$ by completing the square.
- 85)! Factorise fully $8a^2 - 2a^2x^4$.
- 86)! Factorise fully $242\pi^3 - 8\pi x^2$.
- 87)! Factorise fully $3x^2 - 3x - 6$.
- 88)! Factorise fully $2x^4 - 20x^2 + 18$.
- 89)! Simplify $\frac{ax^2}{bx}$.
- 90)! Simplify $\frac{3a^2bx^2y}{15axby}$.
- 91)! Simplify $\frac{4a^2b - 8ab^2}{4ab^2 - 8a^2b}$.
- 92)! Simplify $\frac{x^2 - x - 6}{x^2 + 3x + 2}$.
- 93)! Simplify $\frac{x^2 + 5x + 6}{x^2 - 4}$.
- 94)! Simplify $\frac{x^3 - 64}{x^2 + 4x + 16}$.
- 95)! Simplify $\frac{x^3 - 1}{x^3 + x^2 + x}$.

- 96)! Simplify $\frac{22a^2b}{6ac^2} \times \frac{15bc}{11a}$.
- 97)! Simplify $\frac{2x}{3} \times \frac{9}{4x}$.
- 98)! Simplify $\frac{2}{x+1} \times \frac{5x+5}{4}$.
- 99)! Simplify $\frac{x^3-1}{x^3} \times \frac{2x^2+2x}{x^2-1}$.
- 100)! Simplify $\frac{1}{x^2-5x+6} \times \frac{6x-12}{2}$.
- 101)! Simplify $\frac{x}{5} \div \frac{x}{2}$.
- 102)! Simplify $\frac{7x+14}{3} \div \frac{x+2}{9}$.
- 103)! Simplify $\frac{2}{x^2-3x-4} \div \frac{4}{x^2-4x}$.
- 104)! Simplify $\frac{x+1}{2} + \frac{x-1}{3}$.
- 105)! Simplify $\frac{4}{b} + \frac{1}{3b}$.
- 106)! Simplify $\frac{2}{x+1} + \frac{9}{x+2}$.
- 107)! Simplify $\frac{a+1}{2a-2} + \frac{a-1}{2a+2}$.
- 108)! Simplify $\frac{3}{x} - \frac{1}{x+2}$.
- 109)! Simplify $\frac{1}{x} + \frac{1}{x^2} + \frac{1}{x^3}$.
- 110)! Simplify $\frac{c^2}{c^2-c} - \frac{2c-3}{c+1} \times \frac{c^2+c}{2c^2-c-3}$.
- 111)! If $x = \frac{c^2+1}{c^2-1}$, $y = \frac{c-1}{c+1}$ and $z = \frac{c^2+1}{c+1}$, rewrite, in its simplest form, the expression $\frac{xy}{z}$, in terms of c only.
- 112)! Simplify $\frac{\frac{x}{b} + \frac{y}{a}}{\frac{a}{y} + \frac{b}{x}}$.

[Answers]

- «1»→ 15.2 »
 «2»→ 1.28 »
 «3»→ 6.7×10^{14} »
 «4»→ 0.05 »
 «5»→ 3.81×10^{-5} »
 «6»→ 2.954×10^{-11} »
 «7»→ $1\frac{1}{3}$ »
 «8»→ $\frac{1}{12}$ »
 «9»→ \$27.97 »
 «10»→ \$62.4 billion »
 «11»→ 0.05 »
 «12»→ $\frac{146}{333}$ »
 «13»→ $\frac{92}{333}$ »
 «14»→ $\frac{34}{99}$ »
 «15»→ 27.64 »
 «16»→ 77.94 »
 «17»→ 57378.63 »
 «18»→ 166.32 »
 «19»→ 2.93 »
 «20»→ 1.39 »
 «21»→ 7.9 »
 «22»→ 20 & 21 »
 «23»→ $4\sqrt{7}$ »
 «24»→ 3 »
 «25»→ $6x\sqrt{2xy}$ »
 «26»→ $\frac{2\sqrt[3]{x}}{y}$ »
 «27»→ $\frac{3}{5}$ »
 «28»→ $\sqrt{27}$ »
 «29»→ $-4\sqrt{3}$ »
 «30»→ $9\sqrt{3}$ »
 «31»→ $40\sqrt{3}$ »
 «32»→ $\frac{\sqrt{2}}{2}$ »
 «33»→ $72 + 8\sqrt{3}$ »
 «34»→ 5 »
 «35»→ $4 + 2\sqrt{3}$ »
 «36»→ $49 + 12\sqrt{5}$ »
 «37»→ $\sqrt{6}$ »
 «38»→ $\frac{\sqrt{6} + 3}{3}$ »
 «39»→ $\frac{\sqrt{5} - \sqrt{2}}{3}$ »
 «40»→ $5 + 2\sqrt{6}$ »
 «41»→ 1 »
 «42»→ 1 »
 «43»→ $(a - 1)^2$ »
 «44»→ $16ab$ »
 «45»→ 0 »
 «46»→ $-3ay^2 + 3a^2y$ »
 «47»→ $2x$ »
 «48»→ $x^2 + 3x + 2$ »
 «49»→ $66 + 5z - z^2$ »
 «50»→ $36x^2 - xt - 2t^2$ »
 «51»→ $9a^2 + 24ab + 16b^2$ »
 «52»→ -6 »
 «53»→ $y = -59.14$ »
 «54»→ $v = 424.9$ »
 «55»→ $\Delta H = 69.95$ »
 «56»→ $T = 1.75 \times 10^{14}$ »
 «57»→ $v = \pm 2.24 \times 10^8$ »
 «58»→ $a(x + ay)$ »
 «59»→ $a\sqrt{5}(1 + \sqrt{3}b)$ »
 «60»→ $(a - 1)(x - y)$ »
 «61»→ $(xy^2 - 1)(xy + a)$ »
 «62»→ $(a - \frac{1}{2})(a + \frac{1}{2})$ »
 «63»→ $(2f - 5g)(2f + 5g)$ »
 «64»→ $(\frac{x}{y} - \frac{1}{a})(\frac{x}{y} + \frac{1}{a})$ »
 «65»→ $(a + 1)(a^2 - a + 1)$ »
 «66»→ $(1 - 3a)(1 + 3a + 9a^2)$ »
 «67»→ $(a - \frac{1}{2})(a^2 + \frac{1}{2}a + \frac{1}{4})$ »
 «68»→ $(\frac{5s}{2} + \frac{g}{3})(\frac{25s^2}{4} - \frac{5sg}{6} + \frac{g^2}{9})$ »
 «69»→ $(x^2 + 1)(x^4 - x^2 + 1)$ »
 «70»→ $(x - 2y)(x + 2y)(x^4 + 4x^2y^2 + 16y^4)$ »
 «71»→ $(\frac{a^2}{b^3} + \frac{b^3}{a^2})(\frac{a^4}{b^6} - 1 + \frac{b^6}{a^4})$ »
 «72»→ $(x + 10)(x + 1)$ »
 «73»→ $(x + 5)(x + 10)$ »
 «74»→ $(x + 3y)(x + 2y)$ »
 «75»→ $(5x + 2y)(3x + 2y)$ »
 «76»→ $(x - 6)(x - 10)$ »
 «77»→ $2(3x - 2)(x - 3)$ »
 «78»→ $(6x - 5)(4x + 1)$ »

$$\llcorner 79 \rrcorner \rightarrow (x^2 + 3)(x^2 + 1) \gg$$

$$\llcorner 80 \rrcorner \rightarrow (x + \frac{1}{2})(x + \frac{1}{4}) \gg$$

$$\llcorner 81 \rrcorner \rightarrow (x + \sqrt{7})(x + 2\sqrt{7}) \gg$$

$$\llcorner 82 \rrcorner \rightarrow (x - 3)^2 \gg$$

$$\llcorner 83 \rrcorner \rightarrow (x + 2 + \sqrt{2})(x + 2 - \sqrt{2}) \gg$$

$$\llcorner 84 \rrcorner \rightarrow (x + \frac{5}{2} + \frac{\sqrt{29}}{2})(x + \frac{5}{2} - \frac{\sqrt{29}}{2}) \gg$$

$$\llcorner 85 \rrcorner \rightarrow 2a^2(2 + x^2)(\sqrt{2} + x)(\sqrt{2} - x) \gg$$

$$\llcorner 86 \rrcorner \rightarrow 2\pi(11\pi + 2x)(11\pi - 2x) \gg$$

$$\llcorner 87 \rrcorner \rightarrow 3(x + 1)(x - 2) \gg$$

$$\llcorner 88 \rrcorner \rightarrow 2(x + 3)(x - 3)(x + 1)(x - 1) \gg$$

$$\llcorner 89 \rrcorner \rightarrow \frac{ax}{b} \gg$$

$$\llcorner 90 \rrcorner \rightarrow \frac{ax}{5} \gg$$

$$\llcorner 91 \rrcorner \rightarrow \frac{a - 2b}{b - 2a} \gg$$

$$\llcorner 92 \rrcorner \rightarrow \frac{x - 3}{x + 1} \gg$$

$$\llcorner 93 \rrcorner \rightarrow \frac{x + 3}{x - 2} \gg$$

$$\llcorner 94 \rrcorner \rightarrow x - 4 \gg$$

$$\llcorner 95 \rrcorner \rightarrow \frac{(x^4 - 1)}{x} \gg$$

$$\llcorner 96 \rrcorner \rightarrow \frac{5b^2}{c} \gg$$

$$\llcorner 97 \rrcorner \rightarrow \frac{3}{2} \gg$$

$$\llcorner 98 \rrcorner \rightarrow \frac{5}{2} \gg$$

$$\llcorner 99 \rrcorner \rightarrow \frac{2(x^2 + x + 1)}{x^2} \gg$$

$$\llcorner 100 \rrcorner \rightarrow \frac{3}{(x - 3)} \gg$$

$$\llcorner 101 \rrcorner \rightarrow \frac{2}{5} \gg$$

$$\llcorner 102 \rrcorner \rightarrow 21 \gg$$

$$\llcorner 103 \rrcorner \rightarrow \frac{x}{2(x + 1)} \gg$$

$$\llcorner 104 \rrcorner \rightarrow \frac{(5x + 1)}{6} \gg$$

$$\llcorner 105 \rrcorner \rightarrow \frac{13}{3b} \gg$$

$$\llcorner 106 \rrcorner \rightarrow \frac{11x + 13}{(x + 2)(x + 1)} \gg$$

$$\llcorner 107 \rrcorner \rightarrow \frac{a^2 + 1}{a^2 - 1} \gg$$

$$\llcorner 108 \rrcorner \rightarrow \frac{2(x + 3)}{x(x + 2)} \gg$$

$$\llcorner 109 \rrcorner \rightarrow \frac{x^2 + x + 1}{x^3} \gg$$

$$\llcorner 110 \rrcorner \rightarrow \frac{2c}{c^2 - 1} \gg$$

$$\llcorner 111 \rrcorner \rightarrow \frac{1}{c + 1} \gg$$

$$\llcorner 112 \rrcorner \rightarrow \frac{xy}{ab} \gg$$