PART 1
**Start here if you have not studied trigonometry. Attempt Parts 1 – 3
(Questions 1 – 30)**

Fill in your answers in the column labeled Part 1 on the answer sheet.

1) $5 - 4(2 - 3) =$

A) -1 B) 9 C) -6 D) -23 E) -15

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

A) $\frac{5}{3}$ B) $-\frac{1}{27}$ C) $-\frac{1}{3}$ D) $-\frac{7}{60}$ E) none of these

3) $(7pq^4)(-2p^3q^5) =$

A) $14p^3q^9$ B) $5p^{-2}q^{-1}$ C) $-14p^4q^9$

D) $-14p^3q^{20}$ E) $5p^3q^{20}$

4) If $2x - 4 = 4 + x$, then x is

A) $-\frac{1}{3}$ B) 8 C) 0 D) $\frac{8}{3}$ E) none of these

5) $\frac{12a^3 + 8a}{4a} =$

A) $3a^2 + 2$ B) $5a^2$ C) $12a^2 + 2$

D) $3a^2 + 8a$ E) $12a^3 + 2$

6) $\frac{x^2}{x^5} =$

A) $\frac{2}{5}$ B) $x^{\frac{2}{5}}$ C) $\frac{1}{x^3}$ D) x^3 E) x^{10}

7) $\sqrt[3]{-27}$

A) -3 B) -9 C) 3 D) $-\frac{5}{2}$ E) 9

8) The x – intercept of the graph of the equation $3x - y - 15 = 0$ is x is equal to

A) 15 B) 5 C) 0 D) -5 E) -15

9) $3a - [2 + 2(b - a)] =$

A) $2a + b - 2$ B) $a + 2b - 2$ C) $5a - 2b - 2$

D) $5a - 2b + 2$ E) $7a - 4b$

10) Eggs are to be packed in cartons, each holding 12 eggs. If there are 138 eggs and as many cartons are completely filled as possible, how many eggs are left over?

A) 6 B) 8 C) 11.5 D) 0.5 E) 138

CONTINUE WITH PART 2

PART 2

Start here if you have studied trigonometry. Attempt Parts 2 – 4 (Questions 11 – 40)

Fill in your answers in the column labeled Part 2 on the answer sheet.

11) $(x + 1)(x^2 - x + 1) =$

A) $x^3 - 1$ B) $x^3 - x + 1$ C) $x^3 - x^2 + 1$

D) $x^3 - 2x^2 + 2x - 1$ E) $x^3 + 1$

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12) $\dfrac{8}{r} - \dfrac{5}{s} =$

A) $\dfrac{8s - 5r}{rs}$ B) $\dfrac{3}{rs}$ C) $\dfrac{3}{r - s}$ D) $\dfrac{3}{r + s}$ E) $\dfrac{8s + 5r}{rs}$

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13) The slope of the line $-3x + 5y - 8 = 0$ is

A) $-\dfrac{5}{3}$ B) $-\dfrac{3}{5}$ C) $\dfrac{3}{5}$ D) $\dfrac{8}{5}$ E) $\dfrac{5}{3}$

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(14) $\dfrac{x^2 - 4}{5x} \cdot \dfrac{30}{3x - 6} =$

A) 4   B) $2(x + 2)$ C) $\dfrac{4}{3}$ D) $\dfrac{2(x - 2)}{x}$ E) $\dfrac{2(x + 2)}{x}$

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15) $\left[\dfrac{x^3}{5z}\right]^{-2} =$

A) $\dfrac{x^6 z^2}{25}$ B) $\dfrac{x^6}{5z^2}$ C) $\dfrac{25z^2}{x^6}$ D) $\dfrac{x^6}{25z^2}$ E) none of these

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16) The inequality $4x - 5 < 3x + 8$ is equivalent to the inequality

A) $x < -3$ B) $x < \dfrac{5}{4}$ C) $x < \dfrac{13}{4}$ D) $x < 13$

E) none of these

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17) $t + t^{-1} =$

A) $2t$ B) 1 C) $\dfrac{t + 1}{t}$ D) $\dfrac{t^2 + 1}{t}$ E) 0

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18) If $xy = 2(x + y)$ then $y =$

A) $\dfrac{2x}{x - 1}$ B) $\dfrac{2x}{x + 1}$ C) $\dfrac{2x}{x + 2}$ D) $\dfrac{2x}{x - 2}$ E) $\dfrac{x}{x - 1}$

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19) $\dfrac{1}{\sqrt[4]{16}} =$

A) 64   B) 2   C) $\dfrac{1}{8}$ D) $\dfrac{1}{4}$ E) $\dfrac{1}{2}$

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20) If $2x^2 - 2x = 3$, then $x =$

A) $\dfrac{2 \pm \sqrt{28}}{4}$ B) $\dfrac{-2 \pm \sqrt{28}}{4}$ C) $\dfrac{2 \pm \sqrt{20}}{4}$ D) $\dfrac{-2 \pm \sqrt{20}}{4}$

E) none of these

CONTINUE WITH PART 3

PART 3

Fill in your answers in the column labeled Part 3 on the answer sheet.

21) The domain of the function $f(x) = \sqrt{2x - 14}$ is

A) $-\infty < x < \infty$ B) $x \geq 0$ C) $x \geq 14$

D) $x \leq 7$ E) $x \geq 7$

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22) If $f(x) = x^2$ then $f(x - 1) =$

A) $x^2 - 1$ B) $x^3 - x^2$ C) $x^2 + x - 1$

D) $x^3 - 1$ E) $x^2 - 2x + 1$

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23) $\dfrac{1}{\sqrt{7} + 1} =$

A) $\dfrac{1 - \sqrt{7}}{6}$ B) $\dfrac{\sqrt{7} - 1}{6}$ C) $\dfrac{\sqrt{7} - 1}{48}$

D) $\dfrac{1 + \sqrt{7}}{-48}$ E) $\dfrac{1 + \sqrt{7}}{6}$

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24) In the system of equations $\begin{cases} 2x + 6y = 5 \\ x - 3y = 8 \end{cases}$, one coordinate of the solution is

A) $x = -\dfrac{11}{12}$ B) $x = 0$ C) $x = \dfrac{5}{2}$

D) $x = \dfrac{13}{4}$ E) $x = \dfrac{21}{4}$

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25) $e^x e^y =$

A) $2e^{xy}$ B) e^{2xy} C) e^{xy} D) e^{x+y} E) e^{2+x+y}

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26) The inequality $(x + 3)(x - 2) > 0$ is equivalent to

A) $-3 < x < 2$ B) $x < -3$ or $x > 2$ C) $-2 < x < 3$

D) $x < -2$ or $x > 3$ E) none of these

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27) The slope of the line through the points $(-5, -3)$ and $(-1, -8)$ is

A) $\dfrac{4}{5}$ B) $-\dfrac{4}{5}$ C) $-\dfrac{5}{4}$ D) $\dfrac{5}{4}$ E) none of these

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28) If $f(x) = 5x + 1$ and $g(x) = x^2$, then $g(f(x)) =$

A) $x^2(5x + 1)$ B) $5x^2 + 1$ C) $x^2 + 5x + 1$

D) $25x^2 + 1$ E) $(5x + 1)^2$

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29) $\log_3(9) =$

A) $\dfrac{1}{3}$ B) 27 C) 12 D) 2 E) 3

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30) $\log_{10}(4) + \log_{10}(x) =$

A) $\log_{10}(4^x)$ B) $\log_{10}(4 + x)$ C) $2\log_{10}(2x)$
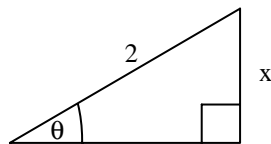
D) $\log_{10}(4x)$ E) $\log_{10}(x^4)$

Continue with Part 4 if you have studied trigonometry, otherwise review your answers to questions 1 – 30

PART 4
TRIGONOMETRY

Unless otherwise stated, angles are in radians
Fill in your answers in the column labeled Part 4 on the answer sheet.

31) In the right triangle shown,

$\cos \theta =$

A) $\dfrac{\sqrt{4 - x^2}}{1}$ B) $\dfrac{\sqrt{4 - x^2}}{x}$ C) $\dfrac{2}{x}$ D) $\dfrac{x}{2}$ E) none of these

32) $\sin \dfrac{\pi}{3} =$

A) $\dfrac{\sqrt{3}}{2}$ B) $\dfrac{1}{2}$ C) $\dfrac{\sqrt{2}}{3}$ D) $\dfrac{1}{\sqrt{3}}$ E) none of these

33) What is the radian measure of an angle whose degree measure is 75°

A) $\dfrac{12\pi}{5}$ B) $\dfrac{12}{5\pi}$ C) $\dfrac{5\pi}{12}$ D) $\dfrac{\pi}{12}$ E) none of these

34) For which values of θ in the interval $0^\circ \le \theta \le 180^\circ$ is $\cos 3\theta = 1$?

A) $0^\circ, 120^\circ$ B) 90° C) $30^\circ, 150^\circ$ D) $60^\circ, 180^\circ$

E) none of these

35) Which of the following numbers is largest?

A) $\tan \dfrac{\pi}{6}$ B) $\tan \dfrac{\pi}{4}$ C) $\tan \dfrac{5\pi}{6}$ D) $\tan \pi$ E) $\tan 2\pi$

36) For which of the following values of x is $\dfrac{\cos x}{\sin x}$ not defined?

A) $\dfrac{\pi}{2}$ B) $\dfrac{\pi}{3}$ C) $\dfrac{\pi}{4}$ D) $\dfrac{\pi}{6}$ E) 0

37) $\cos \theta < 0$ and $\tan \theta > 0$ whenever θ is an angle in

A) quadrant I   B) quadrant II   C) quadrant III
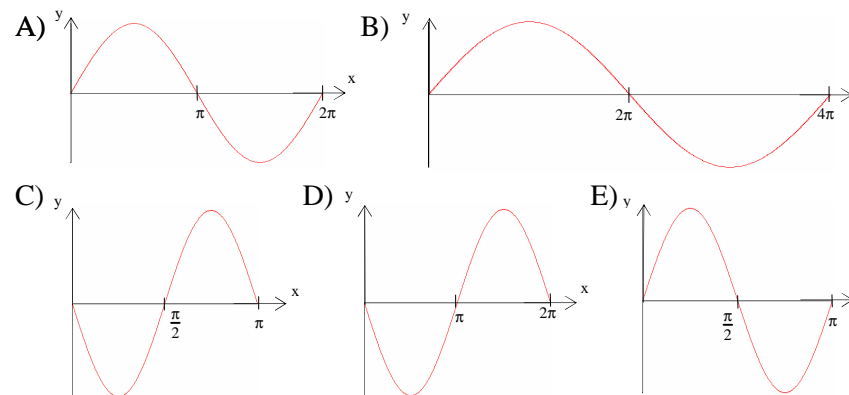
D) quadrant IV   E) quadrant III or IV

38) $\cos^2\theta \sec \theta =$

A) $\tan \theta$ B) $\cot \theta$ C) $\sin \theta$ D) $\cos \theta$ E) $\csc \theta$

39) The period of the function $y = \cos 2x$ is

A) 1   B) $\dfrac{\pi}{2}$ C) π D) 2π E) 4π

40) The figure which best represents the graph of $y = \sin (x)$ is

A)   B)

C)   D)   E)

Review your answers to questions 11 – 40 until time expires.