Mathematics 11 Level
Challenge Exam
For

BCIS/CIS
CIEN
ELEN
NTEN
WQT

PRACTICE VERSION ONLY

Each question is followed by five possible answers labeled (a) through (e). Select the one best answer to each question.

Calculators are **not** permitted.

You should be able to complete this practice test in approximately 45 minutes. The real test contains 40 multiple choice questions with a time limit of 60 minutes.

1. $3\left[4-3(6-7)\right]=$

a) -3 b) 0 c) 9 d) 15 e) 21

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2. $\frac{1}{u}-\frac{5}{v}=$

a) $\frac{-4}{u-v}$ b) $\frac{-4}{u+v}$ c) $\frac{v-5u}{uv}$ d) $\frac{-4}{uv}$ e) $\frac{u-5v}{uv}$

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3. The graph of $x-4y+8=0$ crosses the y-axis at y =

a) -8 b) -2 c) 0 d) 2 e) 8

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4. If $5x-10=2-2x$, then $x=$

a) $-\frac{12}{7}$ b) $-\frac{8}{7}$ c) $\frac{8}{7}$ d) $\frac{12}{7}$ e) 4

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5. $\left(4x^2y\right)\left(-3x^5y^4\right)=$

a) $-12x^7y^5$ b) $-12x^{10}y^4$ c) $x^{-3}y^{-3}$ d) $-12x^7y^4$ e) $x^{10}y^4$

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6. $\frac{3}{3+\frac{1}{2}}$

a) $\frac{3}{4}$ b) $\frac{6}{7}$ c) $\frac{4}{3}$ d) $\frac{3}{2}$ e) 2

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7. $\frac{8}{\sqrt{10}}$

a) $\sqrt{\frac{4}{5}}$ b) $\frac{4\sqrt{10}}{5}$ c) $\frac{\sqrt{10}}{8}$ d) $\frac{4}{\sqrt{5}}$ e) $\frac{\sqrt{5}}{4}$

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8. $\sqrt{50x^8y^{12}}=$

a) $5x^4y^6\sqrt{2}$ b) $25x^8y^{12}$ c) $25x^4y^6$ d) $5x^6y^{10}\sqrt{2}$ e) $5x^4y^6$

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9. The x-coordinate of the solution of the system of equations $\begin{cases} 3x+6y=4 \\ x-3y=1 \end{cases}$ is

a) $\frac{1}{15}$ b) $\frac{1}{3}$ c) 1 d) $\frac{6}{5}$ e) $\frac{5}{3}$

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10. If $a=4$ and $b=-3$, then $|a-b|=$

a) -7 b) -1 c) 1 d) 7 e) 12

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11. $\frac{6m^2+3m}{3m}=$

a) $2m+1$ b) $6m^2$ c) $3m$ d) $6m^2+1$ e) $5m$

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12. The length L of a spring is given by $L=\frac{3}{4}F+8$ where F is the applied force. What force F will produce a length of 10?

a) $\frac{8}{3}$ b) $\frac{16}{3}$ c) $\frac{32}{3}$ d) $\frac{31}{2}$ e) 24

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13. $\left(\frac{3y}{x^4}\right)^{-3}=$

a) $\frac{27y^3}{x^{12}}$ b) $\frac{x^{12}}{27y^3}$ c) $\frac{x^{12}y^3}{27}$ d) $\frac{3y^3}{x^{12}}$ e) $27y^3x^{12}$

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14. $\frac{x^2-9}{3x}\cdot\frac{12}{2x-6}$

a) -3 b) 6 c) $2(x+3)$ d) $\frac{2(x-3)}{x}$ e) $\frac{2(x+3)}{x}$

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15. If $\frac{1}{x-3}+7=\frac{x}{x-3}$, then $x=$

a) $-\frac{10}{3}$ b) $-\frac{1}{3}$ c) $\frac{1}{3}$ d) $\frac{10}{3}$ e) 8

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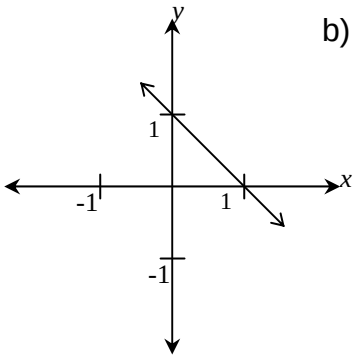
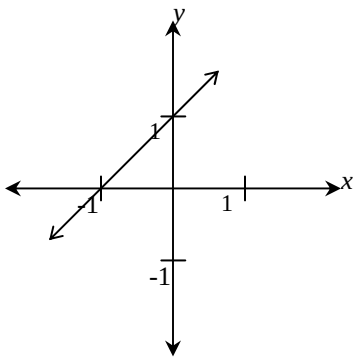
16. The graph of $x + y = 1$ is

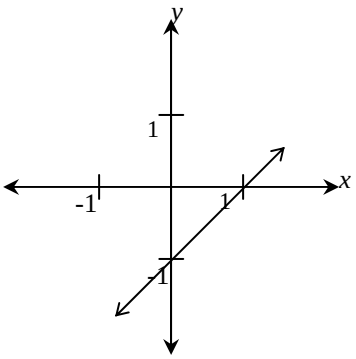
a)



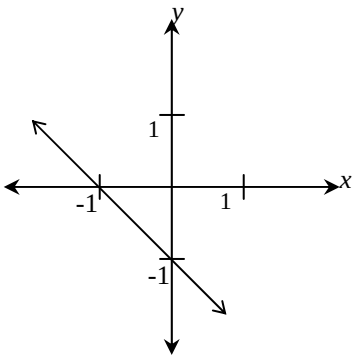
b)



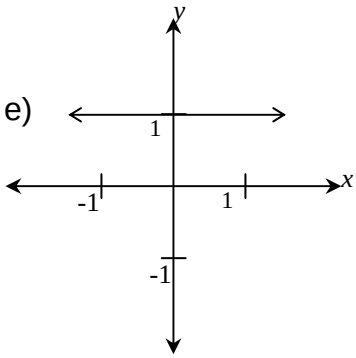
c)



d)



e)



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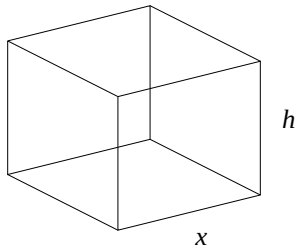
17. The box pictured on the right has a square base and an open top.
Express its surface area in terms of x and h.

a) hx^2 b) $x^2 + 4xh$ c) $2x + h$ d) $4x + 4h$ e) $8x + 4h$



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18. If money in a bank triples every 10 years, then by what factor does it increase over a 30 year period?

a) 3 b) 6 c) 9 d) 27 e) 30

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19. $8^{1/3}16^{-1/2} =$

a) -8 b) $(128)^{-1/6}$ c) $\frac{1}{2}$ d) 2 e) 8

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20. Which of the following best resembles the graph of $y = -\frac{1}{2} + 3x + x^2$

a)  b)  c)  d)  e) 

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21. If the point A has coordinates (-4, 2) and the point C has coordinates (5, 14) , then the distance from A to C in the xy-plane is

a) 9 b) 12 c) 13 d) 15 e) 25

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22. Suppose the sides of a rectangle with length *x* and width *y* are each tripled. The increase in area of the rectangle is:

a) $2xy$ b) $3xy$ c) $8xy$ d) $9xy$ e) x^3y^3

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23. $|x-4|<2$ is equivalent to

a) $x>6$ b) $x<6$ c) $-2<x<6$ d) $2<x<6$ e) $2<x<4$

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24. y varies inversely as the square root of x. When x = 25, y = 4. What is the value of y when x = 100?

a) 0.25 b) 2 c) 4 d) 8 e) 10

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25. $\frac{x+1}{\sqrt{x+2}} - \sqrt{x+2}$ simplifies to

a) -1 b) $\frac{-1}{\sqrt{x+2}}$ c) $\frac{3}{\sqrt{x+2}}$ d) $\frac{-2}{x+2}$ e) $\frac{x^2+x-1}{x+2}$

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26. The graph of the equation $5x+2y=10$ is

a) a horizontal line b) a line rising to the right c) a vertical line
d) a line falling to the right e) not a line

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27. The solution set of the inequality $x^2 + 4x - 5 < 0$ is

a) $x < 1$ b) $x > -5$ c) $x > 4$ or $x < -5$ d) $x > 1$ or $x < -5$ e) $-5 < x < 1$

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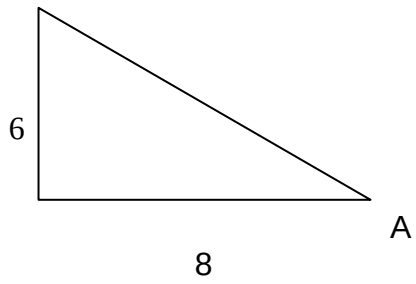
28. In the right-angle triangle in the sketch, the sine of angle A is

a) $\frac{3}{5}$ b) $\frac{4}{5}$ c) $\frac{3}{4}$ d) $\frac{4}{3}$ e) $\frac{7}{12}$



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29. $\sin(60^0) =$

a) 0 b) 1 c) $\frac{1}{2}$ d) $\frac{\sqrt{3}}{2}$ e) $\frac{1}{\sqrt{2}}$

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30. If $f(x) = \frac{2x+6}{x+2}$, then $f(a+2) =$

a) $\frac{5}{2}$ b) $\frac{2a+8}{a+4}$ c) $\frac{2a+10}{a+4}$ d) $\frac{2a+6}{a+2}$ e) $\frac{2a+6}{a+4}$

ANSWER SHEET FOR
MATHEMATICS 11 PRACTICE EXAM

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