

MTH 151–ALGEBRA EXAM ONE (AL1): SAMPLE EXAM

PROBLEM 1. Solve

$$LV = P\left(1 - \frac{LV}{2}\right)$$

for V . Then $V =$

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|-----------------------|------------------------|-----------------------|------------------------|------------------------|
| A. $\frac{P}{L(P+2)}$ | B. $\frac{P}{2L(1+P)}$ | C. $\frac{2P}{L+2P}$ | D. $\frac{P}{2(1-PL)}$ | E. $\frac{2P}{L(P+2)}$ |
| F. $\frac{2P}{LP+2}$ | G. $\frac{2PL}{2-P}$ | H. $\frac{2P}{L} + 1$ | I. $\frac{2PL}{2+P}$ | J. Not listed here. |
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PROBLEM 2. A woman has \$1.75 in change consisting of two more nickels than dimes. The number of dimes is closest to

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|-------|-------|-------|-------|-------|
| A. 18 | B. 15 | C. 17 | D. 14 | E. 11 |
| F. 10 | G. 9 | H. 16 | I. 12 | J. 13 |
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PROBLEM 3. Factor the polynomial

$$6x^2 + 5x - 21$$

Then one of the factors is

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|-------------|-------------|-------------|-------------|---------------------|
| A. $2x + 4$ | B. $2x + 5$ | C. $3x + 7$ | D. $2x + 7$ | E. $3x - 5$ |
| F. $3x + 5$ | G. $2x + 9$ | H. $3x - 7$ | I. $3x + 2$ | J. Not listed here. |
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PROBLEM 4. Which of the following expressions is the solution to

$$x^2 + x - 1 = 0$$

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|------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| A. $\frac{1}{2}(-3 \pm \sqrt{21})$ | B. $\frac{1}{2}(-1 \pm \sqrt{5})$ | C. $\frac{1}{3}(-3 \pm \sqrt{6})$ | D. $\frac{1}{2}(-1 \pm \sqrt{3})$ | E. $\frac{1}{2}(-1 \pm \sqrt{7})$ |
| F. $\frac{1}{2}(-2 \pm \sqrt{6})$ | G. $\frac{1}{2}(-2 \pm \sqrt{2})$ | H. $-1 \pm \sqrt{3}$ | I. $4 \pm \sqrt{2}$ | J. Not listed here |
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PROBLEM 5. A landscape architect wants to make an exposed gravel border of uniform width around a small shed behind a company plant. The shed is 10 feet by 6 feet. He has enough gravel for 80 square feet. The width of the border is closest to

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|--------|--------|--------|--------|--------|
| A. 2.6 | B. 2.5 | C. 2.1 | D. 1.9 | E. 2.4 |
| F. 2.9 | G. 2.0 | H. 2.8 | I. 2.7 | J. 2.3 |
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PROBLEM 6. Solve the equation

$$2x^2 = x + 1$$

The smaller solution, if any, is closest to

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|---------|---------|---------|---------|---------|
| A. -1.5 | B. -1.0 | C. -3.5 | D. -2.0 | E. -4.0 |
| F. -2.5 | G. 0.5 | H. -0.5 | I. 0 | J. -4.5 |

EXAM CONTINUES ON BACK OF SHEET

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PROBLEM 7. Simplify

$$\frac{\frac{x^2-x-2}{x^2+x-2}}{\frac{x^2-4}{2x^2-3x+1}}$$

to lowest terms

- A. $\frac{x^2+2x+1}{2x^2+5x-3}$ B. $\frac{x^2-5x+6}{x^2+10x+21}$ C. $\frac{x^2-3x+2}{x^2-6x-7}$ D. $\frac{2x^2+x-1}{x^2+4x+4}$ E. $\frac{x-5}{x+7}$
 F. $\frac{x^2+x-2}{x^2+8x+7}$ G. $\frac{2x^2+x-1}{x^2-4}$ H. $\frac{x^2+4x+4}{x^2-9x+14}$ I. $\frac{x^2+3x+2}{x^2+6x-7}$ J. Not listed here.

PROBLEM 8. Simplify the expression

$$\frac{2^2(2x^2)^{-2}}{(2x)^{-1}}$$

There should be at most one occurrence of each letter and all exponents should be positive. The simplified form is

- A. $\frac{2}{x^3}$ B. $\frac{1}{2x^7}$ C. $2x^7$ D. 2 E. $\frac{x}{4}$
 F. x^2 G. $\frac{4}{x}$ H. $\frac{1}{4x}$ I. $\frac{1}{2}$ J. Not listed here.

PROBLEM 9. Add

$$\frac{3}{2h^2-3h-2} + \frac{4}{2h^2-5h-3}$$

Write your answer in lowest terms. The simplified form is

- A. $\frac{14h^2-27h-17}{4h^4+5h^2+19h+6}$ B. $\frac{7h+17}{2h^3-9h^2+7h+6}$ C. $\frac{7h-11}{2h^3+9h^2+7h-6}$ D. $\frac{7h-17}{2h^3-9h^2+7h-6}$
 E. $\frac{2h-5}{2h^3+3h^2-11h-6}$ F. $\frac{7h-17}{2h^3+9h^2-7h+6}$ G. $\frac{7h+17}{2h^3+3h^2-11h-6}$ H. $\frac{7}{4h^4+5h^2+19h+6}$
 I. $\frac{2h-5}{2h^3-9h^2+7h+6}$ J. Not listed here.

PROBLEM 10. Expand $4x - 5[2x - (-5 + 3x)]$ to remove the parentheses. The resulting polynomial equals:

- A. $-9x + 25$ B. $x - 25$ C. $x + 25$
 D. $-21x + 25$ E. $-21x - 25$ F. $-x + 25$
 G. $9x - 25$ H. $9x + 25$ I. $21x - 25$
 J. Not listed here.

PROBLEM 11. Expand $(-4 + 7x)(-5 + 6x)$ to remove the parentheses. The result is:

- A. $20 - 24x + 42x^2$ B. $20 + 11x + 42x^2$ C. $20 - 94x + 42x^2$
 D. $20 - 59x + 42x^2$ E. $-60 + 11x - 42x^2$ F. $-5 + 2x + 7x^2$
 G. $-20 - 107x + 42x^2$ H. $5 - 10x + 7x^2$ I. $20 + 11x - 42x^2$
 J. Not listed here.

PROBLEM 12. Matt Whitney won \$250,000 in a state lottery. He paid income tax of 40% on the winnings. He invested some of the rest at 8% and some at 6%, making \$10,920 interest per year. The amount invested at 8% is closest to

- A. \$65000 B. \$80000 C. \$55000 D. \$95000 E. \$85000
 F. \$100000 G. \$90000 H. \$75000 I. \$60000 J. \$70000

The correct answers are: 1-E, 2-E, 3-C, 4-B, 5-G, 6-H, 7-D, 8-A, 9-J, 10-G, 11-D, 12-D