

Problem	1	2	3	4	5	6	7	8	9	10	11	12
Lesson Origin	20, 23, 25	19	20	21	24	22	25	24	19	20	23	24

Problem	13	14	15	16	17	18	19	20	21	22	23	24	25
Lesson Origin	20	25	24	20	19	21,22	24	25	24,21	25	24	24	20

1.

A. $b = 2x + 3$, $h = x + 4$

Total Area = $(A = lw) + (A = \frac{1}{2}bh)$

$$TA = 2x^2 + 13x + 15 + ((\frac{1}{2})(x + 4)(2x + 3))$$

$$TA = 2x^2 + 13x + 15 + (\frac{1}{2}(2x^2 + 3x + 8x + 12))$$

$$TA = 2x^2 + \frac{26}{2}x + 15 + x^2 + \frac{11}{2}x + 6$$

$$TA = 3x^2 + \frac{37}{2}x + 21\text{ft}^2$$

The area of the triangle needs to be found. Because the lengths are binomials, the area will be a trinomial. Then the rectangle and triangle areas need to be added together.

B.

$$2x^2 + 13x + 15$$

$$(2x + 3)(x + 5)$$

$$l = 2x + 3 \quad w = x + 5$$

The rectangle's area is $A = 2x^2 + 13x + 15$. To find the side lengths, factor the polynomial.

C.

$$P = l + 2w + 2 \text{ slant height}$$

$$P = (2x + 3) + 2(x + 5) + 2(x + 1)$$

$$P = 2x + 3 + 2x + 10 + 2x + 2$$

$$P = 6x + 15\text{ft}$$

D.

$$5x^2 - 7x + 696 = 720$$

$$5x^2 - 7x - 24 = 0$$

$$(5x + 8)(x - 3)$$

$$5x + 8 = 0, x - 3 = 0$$

$$x = -\frac{8}{5}, 3$$

Factor the trinomial since the side of the house is a rectangle. There are no extraneous answers since the dimensions of the front of the house are unknown.

2. B

$$\begin{aligned} & (11x^8y)^2 \cdot x^5 \\ & 11^2 x^{16} y^2 \cdot x^5 \\ & 11^2 x^{(16+5)} y^2 \\ & 121x^{21}y^2 \end{aligned}$$

Distractor Rationale:

- A) This answer multiplies $11 \cdot 2$ rather than squaring 11.
- C) This answer adds the exponents for x before distributing the 2.
- D) This answer ignores x^5 .

3. C

There is no work for this problem

Distractor Rationale:

- A) The largest degree is 3. Therefore, this cannot be a quadratic polynomial.
- B) The largest degree is 3. Therefore, this cannot be linear.
- D) The largest degree is 3. Therefore, this cannot be a 5th degree polynomial.

4. C

$$\begin{aligned} & xy^2 + 4xy - 2y - 8 \\ & (xy^2 + 4xy) + (-2y - 8) \\ & xy(y + 4) - 2(y + 4) \\ & (xy - 2)(y + 4) \end{aligned}$$

Distractor Rationale:

- A) This incorrectly uses an addition sign in the first binomial expression.
- B) This is the middle step but does not completely factor the expression.
- D) This incorrectly grouped the GCF of the first set of terms with -4 .

5. B

$$\begin{aligned} & 2x^3 + 10x^2 + 12x \\ & 2x(x^2 + 5x + 6) \\ & 2x(x + 3)(x + 2) \end{aligned}$$

Distractor Rationale:

- A) This factors the GCF correctly but does not factor the trinomial.
- C) The first binomial still contains a GCF, so factoring is not complete.

6. A

Let the whole numbers be x and y .

$$xy = 48$$

$$x = 5y - 8$$

$$(5y - 8)y = 48$$

$$5y^2 - 8y = 48$$

$$5y^2 - 8y - 48 = 0$$

$$(5y + 12)(y - 4) = 0$$

$$y = 4 \text{ or } y = -\frac{12}{5} \text{ (not a whole number)}$$

$$y = 4, \text{ so } x = 12.$$

Distractor Rationale:

B, C, D) These all result in a product of 48 but do not make the second sentence true.

7. D

$$2x^2 - 8x = -6$$

$$2x^2 - 8x + 6 = 0$$

$$2(x^2 - 4x + 3) = 0$$

$$2(x - 1)(x - 3) = 0$$

$$x = 1, 3$$

Distractor Rationale:

A) This is the opposite value for both solutions.

B) This would be the answer if -6 was used instead of $+6$ when factoring and $8x$ was positive.C) This would be the answer if -6 was used instead of $+6$ when factoring.

8. C

$$64x^2 - 49$$

$$(8x - 7)(8x + 7)$$

Distractor Rationale:

A, B) These represent perfect square trinomials.

9. C

$$(10^2 b^{50})^{\frac{1}{2}}$$

$$10^2 \cdot \frac{1}{2} a^{15} b^{25}$$

$$10a^{15} b^{25}$$

Distractor Rationale:

A) This doubles the exponents rather than multiplying by one half.

B) This adds one half to both exponents.

D) This adds unlike bases together, which is not possible mathematically.

10. A

$$P = 2l + 2w$$

$$P = 2(x + 6) + 2(x - 1)$$

$$P = 2x + 12 + 2x - 2$$

$$P = 4x + 10\text{units}$$

Distractor Rationale:

B) This is the sum of two sides. The perimeter should include all 4 sides.

C) This incorrectly multiplies the x 's together.

D) This is the area of the rectangle.

11. B

$$x^2 - 7x - 30$$

$$(x + 3)(x - 10)$$

Distractor Rationale:

A) This results in a middle term of $+7x$.C) This results in $x^2 - 11x + 30$.

12. B

$$6x^2 - 19x + 15 = 0$$

$$(2x - 3)(3x - 5) = 0$$

$$x = \frac{3}{2}, \frac{5}{3}$$

Distractor Rationale:

A) The sign of the first value is incorrect.

C) The sign of the first and second values are incorrect.

D) The sign of the second value is incorrect.

13. C

$$(x - y)^2$$

$$(x - y)(x - y)$$

$$x^2 - 2xy + y^2$$

Distractor Rationale:

A) This answer does not contain a middle term and has the incorrect sign for the last term.

B) This answer does not contain a middle term.

D) This answer has the incorrect sign for the last term.

14. D

$$x^2 - 5 = 4$$

$$x^2 - 9 = 0$$

$$(x + 3)(x - 3) = 0$$

$$x = -3, 3$$

Distractor Rationale:

- A) This is the solution if x^2 is ignored.
- B) This is only one of the two solutions.
- C) This is only one of the two solutions.

15. D

$$V = x(3x - 1)(x + 5)$$

$$0 = x(3x - 1)(x + 5)$$

$$x = 0, \frac{1}{3}, -5$$

Side lengths cannot be negative or 0. When plugging in $\frac{1}{3}$, the volume will be 0.

Distractor Rationale:

- A) Side lengths cannot be negative or zero.
- B-C) Side lengths cannot be zero.

16. C

There is no work for this problem.

Distractor Rationale:

- A) This answer has the terms written in reverse order.
- B) This answer does not have the term with the largest degree first.
- D) This answer has the constant term and middle term switched.

17. D

$$(8a)^2 = 64a^2$$

Distractor Rationale:

- A) This answer does not square the variable and doubles 8 rather than squaring 8.
- B) This answer doubles 8 rather than squaring 8.
- C) This answer does not square the variable.

18. A

$$9x^2 - 144$$

$$9(x^2 - 16)$$

$$9(x - 4)(x + 4)$$

Distractor Rationale:

B) This answer does not factor out the GCF and represents a perfect square trinomial.

C) This answer does not factor out the GCF; therefore, it is not factored completely.

D) This answer represents a perfect square trinomial.

19. D

There is no work for this problem.

Not factorable.

Distractor Rationale:

A, B, C) These answers do not result in a middle term of $-x$.

20. B

$$x(5x + 2) = 24$$

$$5x^2 + 2x - 24 = 0$$

$$(5x + 12)(x - 2) = 0$$

$$x = -\frac{12}{5}, 2$$

A side length cannot be negative

$$x = 2$$

$$5(2) + 2 = 12$$

The dimensions are 2 feet by 12 feet

Distractor Rationale:

A, C) The larger side of the rectangle is five times the smaller plus two. This is not true for these answers.

D) It is not possible to have a negative side length.

21. C

$$14x^2y - 7x^2$$

$$7x^2(2y - 1)$$

Distractor Rationale:

A) This is the GCF but not the complete answer.

B) This does not multiply back to the original problem.

D) This does not factor out the GCF.

22. A

Each side length: $x - 2 - 2 = x - 4$ The area is $(x - 4)^2 = 121$

Distractor Rationale:

B) This does not include 2 being subtracted from both corners on one side.

C) This answer adds in one side of the corner rather than subtracting it.

D) This answer adds the two corners to x rather than subtracting them.

23.

■ 2

■ $(5y + 2)$ □ $(25y - 4)$ ■ $(5y - 2)$ $50y^2 - 8$ $2(25y^2 - 4)$ $2(5y + 2)(5y - 2)$

Distractor Rationale:

The incorrect answer does not have the correct exponent for the term $25y$.

24.

□ -6

■ -5

□ 5

■ 6

 $x^2 - x - 30 = 0$ $(x - 6)(x + 5) = 0$ $x = 6, -5$

Distractor Rationale:

The signs of the incorrect values are the opposite of the correct values.

25.

■ binomial

□ linear

■ quadratic

□ constant

There is no work for this problem.

Distractor Rationale:

“Trinomial” means that the expression has three terms.

“Linear” means that the highest degree is 1.

“Constant” means that the highest degree is 0.