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Pretest

Exponents

Solve numbers 1 to 5.

1. Which expression can be simplified to x^3?

Ⓐ $(x^2)^1$

Ⓑ $x^3 \times x^1$

Ⓒ $\frac{x^3}{x^1}$

Ⓓ $\frac{x^8}{x^5}$

2. A rectangle has a width of $2t^2$ and a length of $3t + 4$. What is the area of the rectangle?

Ⓐ $6t^3 + 8t^2$

Ⓑ $6t^2 + 8t^2$

Ⓒ $6t^3 + 4$

Ⓓ $2t^2 + 3t + 4$

3. How can you simplify the expression?

$$(m^5)^2$$

Ⓐ Add the exponents.

Ⓑ Subtract the exponents.

Ⓒ Multiply the exponents.

Ⓓ Divide the exponents.

4. Suppose b is a number greater than 1. What is the greatest common factor of the terms of the expression?

$$3b^4 + 8b^3$$

Ⓐ b

Ⓑ $3b$

Ⓒ b^2

Ⓓ b^3

5. A parallelogram has an area of $2x^3 + 8x$. The height of the parallelogram is $2x$. What is the length of the base?

Ⓐ $x^3 + 4$

Ⓑ $x^2 + 4x$

Ⓒ $x^2 + 4$

Ⓓ $x^2 + 8$

Benchmark 1

Lessons 1–4

Solve numbers 1 to 16.

1. Which expression can **not** be simplified by adding the exponents?

Ⓐ $c^4 \times c^7$

● $(b^2)^5$

Ⓒ $q^8 \times q^3$

Ⓓ $d^1(d^1)$

2. Jennifer's square mirror has an area of 200 square centimetres. About how long is each side of her mirror?

Ⓐ between 13.0 cm and 13.5 cm

Ⓑ between 13.5 cm and 14.0 cm

● between 14.0 cm and 14.5 cm

Ⓓ between 14.5 cm and 15.0 cm

3. What is the value of x when $\frac{x}{5} + 2 = 3$?

Ⓐ $\frac{1}{5}$

Ⓑ 1

● 5

Ⓓ 25

4. What is the value of z when $\frac{2}{5}z - 3 = 1\frac{1}{2}$?

Ⓐ $^{-}3\frac{3}{4}$

Ⓑ $\frac{^{-}3}{5}$

Ⓒ $1\frac{4}{5}$

● $11\frac{1}{4}$

5. Which equation has the ordered pair $(2, ^-3)$ as a solution?

Ⓐ $y = \frac{1}{2}x - 1$

Ⓑ $y = ^-2x + 1$

Ⓒ $y = 2x - 1$

Ⓓ $y = \frac{1}{2}x + \frac{7}{2}$

6. A line passes through points $(^-6, ^-1)$ and $(3, 2)$. What is the gradient of the line?

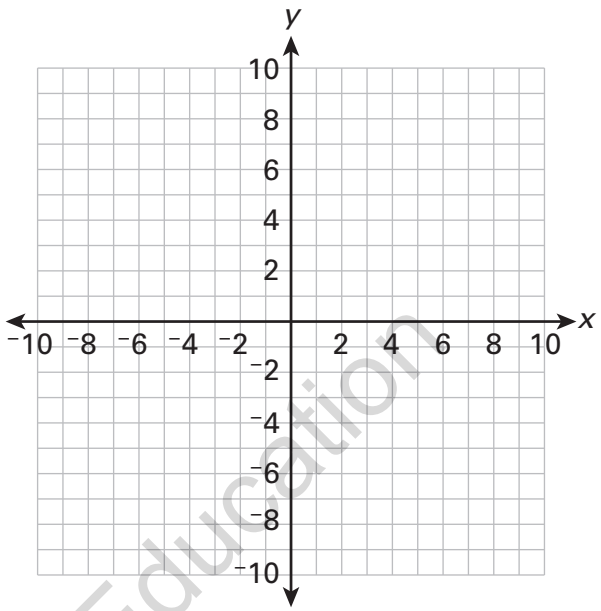
Ⓐ $^-3$

Ⓑ $^-\frac{1}{3}$

Ⓒ $\frac{1}{3}$

Ⓓ 3

7. Graph $y = ^-\frac{1}{2}x + 2$. Which pair of points is on the graph?



Ⓐ (2, 0) and (0, 4)

Ⓑ (2, 0) and $(^-4, 4)$

Ⓒ (0, 2) and $(4, ^-4)$

Ⓓ (0, 2) and (4, 0)

8. The following set of simultaneous equations has no solution.

① $y = ^-\frac{1}{2}x + 5$

② $y = 2 - \frac{1}{2}x$

What must be true about their graphs?

Ⓐ They are coinciding lines.

Ⓑ They are parallel lines.

Ⓒ They are intersecting lines.

Ⓓ They are perpendicular lines.

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9. Which expression can you substitute for y to solve this set of simultaneous equations?

① $y = \frac{1}{2}x + 4$

② $y = {}^{-}3x$

Ⓐ $^{-}3x$

Ⓑ $\frac{1}{2}x$

Ⓒ $\frac{1}{2}x - 4$

Ⓓ $3x$

10. Angle pairs are formed when a transversal crosses a pair of parallel lines. If an angle pair formed by parallel lines and a transversal is **not** supplementary, which must be true?

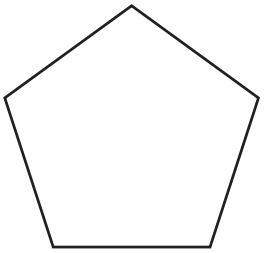
Ⓐ The angles are alternate interior angles.

Ⓑ The angles are the same measure.

Ⓒ The angles are corresponding angles.

Ⓓ The angles are vertically opposite angles.

11. Jeremy will use his protractor to draw a regular pentagon. What should the measure of each angle be?



Ⓐ 108°

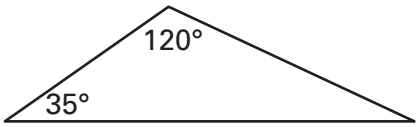
Ⓑ 216°

Ⓒ 300°

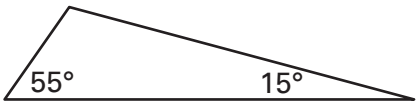
Ⓓ 540°

12. Which of the following triangles is similar to triangle Z?

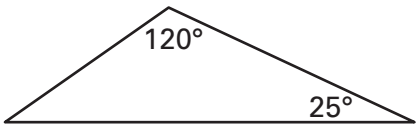
Ⓐ



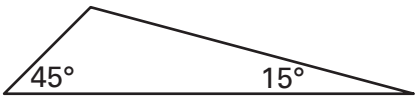
Ⓑ



Ⓒ



Ⓓ



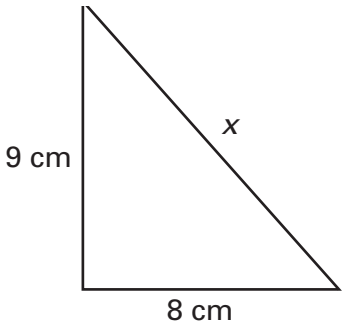
13. Two side lengths of a triangle are shown. What must the length of x be for the triangle to be a right-angled triangle?

Ⓐ $\sqrt{17}$ cm

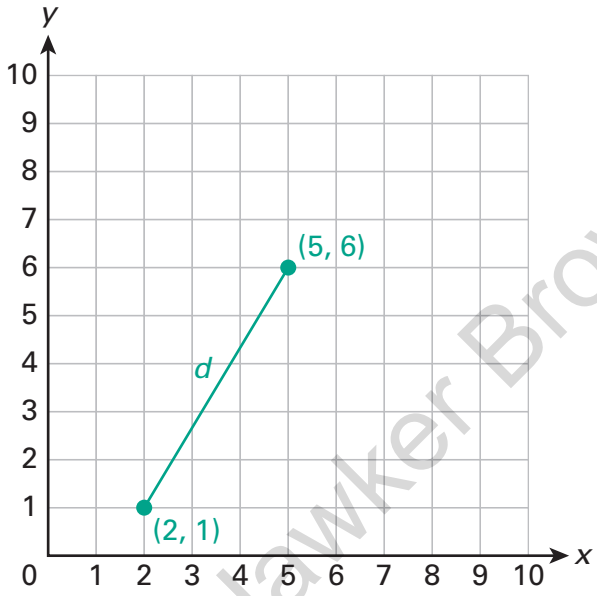
Ⓑ $\sqrt{34}$ cm

Ⓒ $\sqrt{72}$ cm

Ⓓ $\sqrt{145}$ cm



14. What is the distance, d, between the points (2, 1) and (5, 6)?



Ⓐ $\sqrt{30}$ units

Ⓑ $\sqrt{32}$ units

Ⓒ $\sqrt{34}$ units

Ⓓ $\sqrt{98}$ units

15. The number of minutes Tyler has spent commuting to work so far this week are 65, 90, 75 and 50. If it takes him 40 minutes to commute tomorrow, how will the mean and median change?

Ⓐ The mean will decrease by 6 and the median will increase by 5.

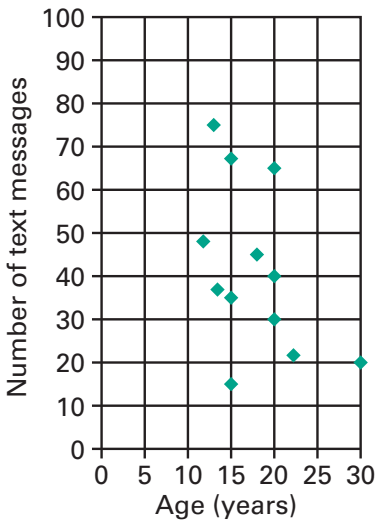
Ⓑ The mean will decrease by 5 and the median will increase by 6.

Ⓒ The mean will decrease by 6 and the median will decrease by 5.

Ⓓ The mean will decrease by 5 and the median will decrease by 6.

16. The scatter plot shows the number of text messages sent in one hour by people of different ages.

Text messages by age (1 hour)



Which statement describes the relationship shown by the graph?

Ⓐ There is no relationship between a person's age and the number of text messages sent.

Ⓑ Older people send more text messages.

Ⓒ Younger people send more text messages.

Ⓓ As people get older, they do not send text messages.

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Post test

Exponents

Solve numbers 1 to 5.

1. Which expression can be simplified to 1, assuming $x \neq 0$?

Ⓐ $x^5 - x^5$

Ⓑ $x^1 \times x^1$

Ⓒ $\frac{x^3}{x^3}$

Ⓓ $(x^1)^1$

2. Which expression is equivalent to $6x^5 + 2x^2$?

Ⓐ $2x^2 \times 3x^2$

Ⓑ $2x^2(3x^3 + 1)$

Ⓒ $x^2(6x^3 + 1)$

Ⓓ $6x^2(x^3 + 1)$

3. A cereal box has a volume of $15x^3 + 5x^2$. The area of the base is $3x^2 + x$. What is the height of the box?

Ⓐ $12x^2 + 4x^2$

Ⓑ $5x + 1$

Ⓒ $5x + 4$

Ⓓ $5x$

4. Which expression is equivalent to the expression below?

$$(2x^2 \times 4)^3$$

Ⓐ $8x^6 \times 64$

Ⓑ $6x^6 \times 12$

Ⓒ $8x^5 \times 64$

Ⓓ $6x^5 \times 12$

5. Which expression shows terms with no common factors?

Ⓐ $9z^3 + 5z$

Ⓑ $2x^2 + 14$

Ⓒ $12y^5 + 9y^3 + 2$

Ⓓ $4w^4 + 7w^2 + w$