

Scrap paper is available but write your final solution clearly in the space provided

1. Factor. $3x^2 + 13x + 12$

[A] $(3x + 4)(x - 3)$

[B] $(3x + 4)(x + 3)$

[C] $(3x - 4)(x - 3)$

[D] $(x + 3)(3x - 4)$

2. **Communication** The table gives the area and three side lengths for two similar right triangles. Describe the relationship between the ratio of the lengths of the corresponding sides and the ratio of the areas.

	Area (m ²)	Side 1	Side 2	Side 3
Triangle A	24	6	8	10
Triangle B	96	12	16	20

3. **Application** The lengths of two similar rectangles are 14 cm and 11 cm. What is the ratio of the corresponding side lengths? the areas?

4. Write the equation of the circle, given its centre and radius.
centre (0, 0), radius 7

[A] $x^2 + y^2 = 14$

[B] $\frac{x^2}{14} + \frac{y^2}{14} = 1$

[C] $x^2 + y^2 = 7$

[D] $x^2 + y^2 = 49$

5. Find the midpoint of the line segment with endpoints $(-8, 5)$ and $(-5, 3)$.

[A] $\left(-\frac{3}{2}, 1\right)$

[B] $(-13, -8)$

[C] $\left(-\frac{3}{2}, -1\right)$

[D] $\left(-\frac{13}{2}, 4\right)$

6. Factor. $9x^3 - 81x^2 + 36x^2 - 324x$

[A] $9x(x-9)(x+4)$

[B] $(9x-10)(9x+5)$

[C] $x(9x-10)(9x+5)$

[D] $9(x-9)(x+4)$

7. Sketch the graph of each parabola. Determine any intercepts, to the nearest tenth, and find two other points on the graph.

a) $y = -(2-x)^2$

b) $y = 3(x-1)^2 - 2$

c) $y = -1.5(x+1)^2 + 3$

d) $y = 3(x-2)^2 + 4$

8. Solve the system of equations by substitution or elimination. Check the solution.

a) $x - 2y = 0$

b) $2x + 3y = 41$

c) $3x + 5y = -37$

$3x + 2y = 16$

$4x + 5y = 71$

$4x + 7y = 19$

d) $y = \frac{7}{5}x + 5$

e) $13 = 4x - 3y$

f) $3y = \frac{4}{5}x - 1$

$y = \frac{1}{5}x + 2$

$5x = 59 + 6y$

$6x - 5y - 4 = 0$