<table>
<thead>
<tr>
<th>#</th>
<th>Answer</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$-75b^2$</td>
<td>$-3(-5b)^2$ Combine like terms</td>
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<td></td>
<td></td>
<td>$-3(25b^2)$ Square both the $-5$ and the $b$</td>
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<tr>
<td>2.</td>
<td>$x = \frac{15}{2}$</td>
<td>$3(2x - 5) = 4x$ Cross-multiply</td>
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<td>3.</td>
<td>$918.75%$</td>
<td></td>
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<tr>
<td>4.</td>
<td>$8v^7 - 10v^6 - 8v^5 + 6v^4$</td>
<td>Distributive Property</td>
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<tr>
<td>5.</td>
<td>$\frac{3z^{15}}{x^2y^3}$</td>
<td></td>
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<tr>
<td>6.</td>
<td>Domain: all $x$ in the Real numbers</td>
<td>Range: all $y \geq -5$</td>
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<tr>
<td></td>
<td></td>
<td>Domain is the set of allowed input values</td>
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<tr>
<td></td>
<td></td>
<td>Range is the set of possible output values</td>
</tr>
<tr>
<td>7.</td>
<td>A. 1</td>
<td></td>
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<tr>
<td>8.</td>
<td>$f^{-1}(-2) = 2.6$</td>
<td>$f^{-1}(-2)$ is the input $x$ whose corresponding output is $y = -2$. So, $f^{-1}(-2) = 2.6$ since $f(2.6) = -2$</td>
</tr>
<tr>
<td>9.</td>
<td>$h$ is undefined for $x = 0, 6, -6$</td>
<td>Any input that makes the denominator zero will result in the function being undefined.</td>
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<tr>
<td>10.</td>
<td>D. $6x - 5y = -43$</td>
<td>You can either find the equation of the line, or see which equation contains both of the given points.</td>
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<td>11.</td>
<td><img src="image" alt="Graph" /></td>
<td>The equation of a line, in slope-intercept form is $y = mx + b$, where $m$ is the slope (in this case, $m = \frac{2}{1}$, which means a vertical change of 2 units for every one unit of change in the horizontal direction), and $b$ is the $y$-intercept (in this case, the line crosses the $y$-axis at the point (0,2)).</td>
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<tr>
<td>12.</td>
<td>D. $(-4,3)$</td>
<td>You can solve the system using either the substitution or elimination methods, or you can see which of the answer choices satisfy both equations simultaneously.</td>
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<tr>
<td>13.</td>
<td>A. $-\frac{1}{4}, -1$</td>
<td>$4x^2 + 5x + 1 = 0$ Get all terms on left $(4x + 1)(x + 1) = 0$ Factor</td>
</tr>
</tbody>
</table>
14. A parabola in standard form 
y = a(x - h)^2 + k \ has its vertex at the point (h, k), and it opens upward if a > 0. This
equation has vertex (−1, −4), since
h = −1, k = −4. It opens upwards, because
a = 1 > 0.

15. (f − g)(x) = −x^2 + x

16. f(g(x)) = (−3 − 3x^2)^3

Composition of functions

17. x = 12 or x = 20

|4 − 0.25x| = 1 First, isolate the absolute
value expression, then:
4 − 0.25x = 1 or 4 − 0.25x = −1 (since the
quantity inside the absolute value signs
could be positive or negative)

18. \[ \frac{7x + 27}{(x + 9)(x - 9)} \]

Combine terms over a common
denominator, and simplify.

19. D. 2 \frac{2}{5} \ hours

\[ \frac{t}{4} + \frac{t}{6} = 1 \]

20. A. \ f(x) = 330(0.88)^t \ ; \ f(5) = 174

21. $2800

Note that the tractor is depreciating at the
rate of $5200 over 6 years, or $866.67 per
year. So, in 2001 (which is 3 years after
1998), it will have depreciated another
$2600, bringing the value down from $5400
to $2800.

22. 250

Plug in 10 for t in the formula

23. 3.5 hours

\[ P = 50e^{0.3158t} \]. You can solve this
graphically, by finding the intersection of
the graph of the given function and the
function \ P = 150, or solve 150 = 50e^{0.3158t}
by taking the natural logarithm of both sides
of the equation.

24. 116 feet

Since area is length \times width, we know that
20(l) = 760, and the length of the
garden is 38 feet. Next, we must find the
perimeter of the garden using the fact that
the perimeter of a rectangle is given by
\[ P = 2l + 2w \].
Note that the function\
\[ C(x) = 0.5x^2 - 10x + 600 \] is a parabola that opens upward, and the x-coordinate of the vertex of a parabola in the form\
\[ y = ax^2 + bx + c \quad \text{is} \quad x = -\frac{b}{2a} \] (in this case \( x = 10 \)), and so that must be the lowest point on the parabola, which corresponds to the production level that will yield the lowest cost.

You could also graph the cost function, and use the “minimum” function on the graphing calculator to find the low point on the parabola.